



**UNIVERSITY  
OF TWENTE.**

## Bachelor Thesis

Exploring the Impact of Transnational Municipal Climate Network Membership on Local  
Climate Governance: A Case Study of North Rhine-Westphalia

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## **Abstract**

Climate change is broadly recognized as one of today's most urgent and complex challenges. Its effective governance has therefore been argued to transcend mere nation-state capacities and has mobilized diversifying governance actors to engage in an increasingly multilevel governance setting. A striking phenomenon is the emergence of transnational municipal climate networks (TMCNs), connecting cities to collectively address climate change governance. Proactive municipal climate action is of utmost importance considering cities' large contribution to greenhouse gas emissions and high levels of energy consumption. While TMCNs have been internationally celebrated as champions regarding climate change governance, we remain to have limited knowledge of their practical impact on city climate action in certain German regions. Historically, the German federal state of North-Rhine Westphalia (NRW) has been economically dependent on environmentally harmful heavy industry thus making it an interesting case to study practical TMCN impact on selected cities. This thesis, therefore, asks: „*How does TMCN membership impact the local climate governance of the North Rhine-Westphalian cities of Bonn, Paderborn, and Neuss?*“ An exploratory case study research design is followed, combining document analysis of municipal climate action plans with expert interviews in each studied city. NRW cities most prominently benefit from TMCN-enabled tools and project support for local climate governance. These benefits occur beyond cities displaying TMCN membership.

Keywords: Transnational Municipal Climate Networks, North-Rhine Westphalia, Local Climate Governance, Climate Alliance, Covenant of Mayors, ICLEI

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## List of Abbreviations

CO <sub>2</sub>	Carbon Dioxide
EU	European Union
GHG	Green House Gas
ICLEI	Local Governments for Sustainability (Initial Origin of Abbreviation: International Council for Local Environmental Initiatives)
IKK	‘Integriertes Klimaschutzkonzept’ – Integrated Climate Protection Concept (Also referred to as municipal climate action plans)
NKI	„Nationale Klimaschutzinitiative“ – German National Climate Protection Initiative (German National Funding Scheme for Climate Protection Efforts)
NRW	North-Rhine Westphalia
TMCN	Transnational Municipal Climate Network

## 1. Introduction

„Cities are where the climate battle will largely be won or lost“ (United Nations, 2019). With these words, UN Secretary-General António Guterres addresses the attendees of the C40 World Mayors Summit in Copenhagen in 2019. Progressing climate change is a time-pressing, ubiquitously discussed current challenge and its governance has thus been subject to countless discussions. Guterres particularly underlines cities' potential and responsibility regarding mitigation and adaptation to current climate change. Said responsibility is partly justified by cities' high level of energy consumption and contribution to GHG emissions and pollution (United Nations, 2019). Moreover, it has frequently been argued that cities and urban centers are particularly vulnerable to extreme weather events, drought and rising sea levels, as such incidents impact crucial infrastructure that cities are dependent upon (Otto et al., 2021, p. 5). In recent years, it has become evident that climate change is currently impacting regions and livelihoods around the world to differing extents. For this reason, cities have been observed to be „willing and able to take action“ against climate change (Rosenzweig et al., 2010, p. 910).

Climate change is a transboundary policy problem simultaneously affecting all countries, regions and cities to varying extents. It has thus initiated interaction and exchange in an increasingly multilevel and network-oriented governance setting. To foster the potential of inter-city exchange in this context, transnational municipal climate networks (TMCNs) have been established and attributed with high expectations (Heikkinen et al., 2020). While there is no generally applicable definition of TMCNs, they have been previously defined as „organi[z]ations that aim to support cooperation between cities to improve their climate change mitigation and adaptation work“ (Heikkinen et al., 2020, p. 1). Kern and Bulkeley (2009, p. 309f.) define three alternative defining factors, naming a member city's autonomous and voluntary decision to join or exit a network, a TMCN's „non-hierarchical, horizontal and polycentric“ nature and the fact that TMCN decisions are directly implemented by members.

The emergence of TMCNs and the high expectations that have been assigned to their ability to systematically influence global climate policy has led to great scientific interest in TMCNs and their effectiveness. While TMCNs have been celebrated as champions in promoting climate change governance, we continue to have limited knowledge of how they practically influence municipal climate protection efforts. Generally, research has focused on why cities join TMCNs and on how networks can then benefit member cities. To date, the following aspects have mainly been stressed regarding TMCN influence: a network's capacity to enable sharing of knowledge, information and best practices, network engagement in city advocacy and lobbying on a national/ European or international level and providing opportunities to access funding or granting green city branding as a chance for cities to expand their international influence (Busch et al., 2018; Kern & Bulkeley, 2009).

Corresponding research has largely been conducted from a global perspective or has examined TMCNs in certain geographical regions such as in the US (Krause, 2011a, 2012) or the EU (Bulkeley et al., 2003; Kern & Bulkeley, 2009). There has been little attention given to German

membership in TMCNs with few exceptions. Busch et al. (2018) recently investigated the role of TMCNs in Germany, arguing that current knowledge on TMCN impacts has mainly resulted from studies taking network staff as a starting point for investigation. Contrastingly, the authors have stated that it is not so much the services a network and its infrastructure may provide to cities that are most influential for local climate governance. Rather, their analysis of German TMCN member cities has revealed that the act of joining a network and being a member is more significant since „staff in cities mostly uses TMCNs for internal political purposes for internal mobili[z]ation, formulating emission reduction goals and institutionalizing climate trajectories“ (Busch et al., 2018, p. 229). This implies that TMCNs especially influence local climate governance by impacting members' internal decision-making processes. The authors associate these results mostly with the fact that their research concentrated on municipal climate managers rather than taking network staff as a starting point for investigating TMCN impact. They conclude that much former research has concentrated on the „wrong levels of governance“ (ibid.).

Accordingly, there appears to be some tension in academic research surrounding TMCNs. City-level analysis regarding internal use of climate network memberships in Germany has been neglected when analyzing the general impact of TMCNs on local climate governance and policy adoption (Busch et al., 2018). This indicates a current research gap and shortcoming in assessing the impact of TMCNs. Against this backdrop, it appears necessary to further analyze the practical influence that TMCN memberships have on the climate policy development of cities, making municipal administrative staff the focus of analysis. It seems particularly interesting to explore how TMCN membership influences cities toward “preventing, mitigating, or adapting to the risks posed by climate change” (Jagers & Stripple, 2003, p. 388).

The previous observations highlight the scientific relevance to further studying efficient, outcome-oriented climate governance at the local level and attempting to identify benefits which municipalities could gain from network membership. While the research conducted by Busch et al. (2018) focused on assessing TMCN impact at a national level in Germany, no similar research with a subnational focus on a particular federal state has been identified. Emerging knowledge on the impact of TMCNs on German cities thus appears somewhat undifferentiated and understudied, motivating this thesis' focus on a single federal state, namely North Rhine-Westphalia (NRW).

At the same time, the objective of better understanding local climate governance is of particular importance to societal concerns following the impact of climate crises. It appears to be crucial to study and understand which factors promote climate governance to reduce the risks of climatic impacts that could harm crucial infrastructure and put citizen livelihoods at risk.

The thesis at hand aims to answer the following exploratory research question to assess the impact of TMCN membership on selected cities in NRW:

*„How does TMCN membership impact the local climate governance of the North Rhine-Westphalian cities of Bonn, Paderborn, and Neuss?“*

Climate governance is defined here to entail “all the purposeful mechanisms and measures aimed at steering social systems towards preventing, mitigating, or adapting to the risks posed by climate change” (Jagers & Stripple, 2003, p. 388). TMCN membership impact will refer to any identified municipal benefits for policy developments or climate protection initiatives that can be related to TMCN membership. To answer the research question, three additional sub-questions are followed as they are expected to increase clarity and promote the research objective.

(SQ1): Which municipal climate protection objectives and commitments can be identified in the studied cities’ climate action plans? Which TMCN influences become apparent?

(SQ2a): What added value does TMCN membership have for a city’s climate governance and respective policy development?

(SQ2b): Which alternative factors can be identified that account for proactive municipal climate governance?

The thesis is divided into five chapters. Following the introduction to the topic and research objective, the second chapter develops the study’s theoretical foundation, leading up to the formulation of theoretically derived expectations which later inform the analysis. The used methodology is discussed and justified in chapter three. This includes a comprehensive description of the multilayered case selection and addresses the respective data collection and analysis procedures. Chapter four covers the analysis and discussion of the results and is followed by a conclusion which includes reflections on the study’s limitations and provides an outlook for future research.

## **2. Theoretical Framework**

This chapter sets out to develop the theoretical framework to analyze TMCN influence on local climate governance. The underlying theoretical perspective on TMCNs in an increasingly multilevel governance setting is initially explained. This prepares the subsequent review of existing literature on determining factors for climate policy diffusion. Referring to influential external exchange mechanisms, this review serves as the justification to further analyze network structures regarding benefits for municipal climate policy diffusion and governance. Finally, previously associated benefits of TMCN membership for municipal climate governance are identified from corresponding literature to prepare and guide the subsequent analysis of three NRW cities.



## **2.1 Theoretical perspective on transnational-municipal climate networks in a multilevel governance setting: TMCNs as policy networks**

Effective governance is crucial to enable successful climate planning and policy action and hence to meet the global challenges presented by progressing climate change. Since governance structures at the national level have been argued to be insufficient in addressing the complexity of global climate change, climate policy has become subject to increasingly multilevel governance settings (Bulkeley et al., 2003). The multilevel governance approach addresses the evolving relationship between different territorial levels and diverse policy actors in complex global policy spheres. It recognizes the “multiple, multilayered and multidimensional” nature of global policy processes (Budd & Sancino, 2016, p. 131). Against this backdrop of diversifying governance levels, local authorities in cities have increasingly taken action to engage in climate governance. A striking phenomenon that has been observed regarding city climate action is the increasing existence of TMCNs that focus on cooperative climate change mitigation and adaptation work. The emergence of such networks since the late 1980s has been a much-discussed feature of expanding multilevel climate governance (Bulkeley et al., 2003, p. 236).

Although TMCNs have been given increasing attention in the academic sphere, no universally applicable definition becomes apparent as diverse networks have developed, partially differing in structure, selection mechanisms, specializations, and operational processes. For this reason, existing TMCNs are rather difficult to uniformly associate with one specific network type. However, this research will refer to TMCNs as policy networks since this definition is perceived most suitable.

Generally, O’Toole (1997, p. 45) defines networks in public administration as “structures of interdependence involving multiple organizations or parts thereof, where one unit is not merely the formal subordinate of the others in some larger hierarchical arrangement”. Accordingly, networks are argued to represent an alternative, decentralized form of governance which differs from traditional structures of hierarchical administration. Network structures thus enable collaboration among independent entities to pursue a common interest and find solutions to mutual problems that are difficult to solve by individual actors (Agranoff & McGuire, 2001; O’Toole, 1997). Börzel (1998, p. 254) further conceptualizes policy networks as “a set of relatively stable relationships [...] linking a variety of actors, who share common interests with regard to a policy and who exchange resources to pursue these shared interests acknowledging that co-operation is the best way to achieve common goals”. In order to pursue these mutual goals, policy networks are argued to be established formally and intentionally while simultaneously granting members considerable operating autonomy (Provan et al., 2007, p. 482).

While some policy networks are more informal, most TMCNs are membership networks with specific selection requirements concerning commitment to the common goal. A strong common interest among network members is crucial since mitigating climate change portrays a typical

'tragedy of the common', complicating effective collective action in the respective governance area. The investment of resources and time in developing and adopting policies that contribute to climate change mitigation and GHG reductions automatically "entails providing a global public good with non-excludable benefits" (Kammerer & Namhata, 2018, p. 478). This decreases incentives for individual actors to take corresponding initiatives as it leads to the expectation of free-riding behavior by other actors at varying governance levels.

Nonetheless, global climate change remains a transboundary policy problem that simultaneously affects all countries and regions. Therefore, collaborative, membership-based policy networks that encourage and enable exchange and thus contribute to developing trust and participatory norms have been associated with high expectations concerning collective climate action (Krause, 2012, p. 587).

To further justify the concentration on studying network structures to assess effective climate governance, the concept of policy diffusion is discussed in the following.

## **2.2 Policy Diffusion: Bridging Municipal Climate Governance and Network Influence**

Considering the previously discussed diversification of governance levels, exchange mechanisms and policy actors in the current multilevel governance setting, the adoption of climate policy has been increasingly discussed in the theoretical realm of policy diffusion.

Policy diffusion has generally been defined as "the process in which an innovation is communicated through certain channels over time among the members of a social system" (Rogers, 2003, p. 5). The academic discourse surrounding policy diffusion takes two levels of analysis into account, the unit of analysis as well as its surrounding social structure. It is acknowledged that the "factors leading to innovation adoption by a given unit typically include some combination of internal characteristics and processes and the nature of the unit's interactions with others in the broader social system" (True & Mintrom, 2001, p. 34).

Different internal characteristics of analyzed units have been found to impact policy adoption. Corresponding aspects are mainly defined in terms of "internal determinants of the adopting government [thus its] political, economic, and/or social characteristics" (Krause, 2011a, p. 48). For instance, political orientation and partisanship have been found to yield influence, suggesting that left-wing politicians and parties more actively promote environmental action and climate policy adoption (Kammerer & Namhata, 2018, p. 482). Moreover, internal resources – in terms of population size, level of education and per capita general revenue – have been positively associated with climate action and policy adoption as they increase administrative capacities (Krause, 2011a, p. 49). Additionally, exposure to environmental threats and climate change vulnerability is said to increase government motivation to adopt climate protection policies (Kammerer & Namhata, 2018).

Specifically referring to municipal governments adopting climate policy, state-level characteristics have further been determined influential. For example, national climate action plans

or funding programs for climate protection measures may provide municipal governments with motivation and financial resources to promote local climate policy adoption. (Krause, 2011a, p. 51; Rosenthal et al., 2015, p. 546).

External exchange mechanisms have further been associated with climate policy diffusion as interaction can provide inspiration and incentives for climate action. Such exchange mechanisms have mainly been investigated in terms of inter-state exchange in the realm of policy diffusion. The most frequently referenced determinant appears to be geographical proximity of neighboring countries which leverages exchange and subsequent policy diffusion (Kammerer & Namhata, 2018). However, the previous notion of interaction with a unit's surrounding social system (True & Mintrom, 2001, p. 34) appears to have expanded through the increase of multilevel climate governance mechanisms. There have since been positive associations connecting the diffusion of ideas and innovations with countries' common involvements in international institutions or organizations (Kammerer & Namhata, 2018). This incentivizes the further study of network structures as potentially impactful external exchange platforms.

For the purpose of this thesis, policy networks such as TMCNs are perceived to represent an integral part of a city's social structure. They are thus further investigated to contribute to the understanding of influential factors which benefit local climate governance. Network-initiated exchange might leverage the diffusion of innovative ideas, projects or action components which benefit local climate governance. Accordingly, policy networks are expected to promote "mechanisms of social influence, which manifest through coercion, competition [and] learning" (Kammerer & Namhata, 2018, p. 480).

### **2.3 Associating TMCN membership with potential benefits for local climate governance**

The preceding section reviewed internal and external factors that have been determined to promote climate policy adoption. Since this thesis aims to investigate the influence of TMCN membership on local climate governance, external factors in terms of network-initiated exchange mechanisms and provided incentives are the focus of this thesis. Additional existing literature concerning TMCN effectiveness is reviewed in the following to gain a more differentiated view of potential benefits arising from TMCN membership and subsequently inform the analysis by deriving theoretical expectations.

In academic research surrounding urban climate governance through TMCNs, two streams of literature become evident as predominant. One focuses on investigating why cities join TMCNs by identifying city characteristics that increase or decrease the general likelihood of cities becoming network members (Krause, 2011a; Zahran, Grover, et al., 2008; Zahran, Brody, et al., 2008). The second stream of literature primarily examines how effective TMCNs are in impacting climate governance. It is thus concerned with assessing TMCNs' impact by studying benefits and added

value such networks can leverage for their member cities. Corresponding factors are reviewed to follow the objective of this thesis and explore if and how previously associated benefits of TMCN membership also occur for the NRW cities under study.

*Access to resources.* A frequently stressed beneficial factor of network membership is the increased access to resources - available through the network (1), or through exchanges with other network members (2) - which emerges from an effective network's infrastructure. Such resources can take different forms, ranging from knowledge and expertise to financial- and human resources. Most prominently, TMCNs are argued to function as platforms for information-sharing and knowledge exchange by initiating communication. This is argued to leverage collaborative work toward the common aims that constitute the network (Acuto et al., 2017, p. 17f.). TMCNs have been found to provide members with insight into established 'good'- and 'best'-practices and promote the dissemination of research data that can, in turn, inform policy-making processes and local decision-making in member cities (Kern & Bulkeley, 2009, p. 319f.). The promoted coordination of member cities within the formal network structure is additionally argued to serve the creation of closer direct ties between, for instance, experts working for member cities. This can lead to a direct exchange between TMCN members and correspondingly to the establishment of individual, informal networks which may additionally accelerate effective climate action (Busch et al., 2018).

*Policy learning.* Another prominently discussed benefit regarding TMCNs is their ability to promote policy learning (Bulkeley et al., 2003; Busch et al., 2018; Karhinen et al., 2021; Kern & Bulkeley, 2009). By initiating exchange and supporting local entities with securing funding for research projects, TMCNs contribute to the development and spread of innovative policy solutions. The networks' capacity to foster coordination and exchange among member cities may in turn facilitate policy learning by inspiring others to adopt similar ideas or environmental goals in their local contexts. When studying TMCNs in German cities, Busch et al. (2018, p. 227) identified particular network impact on member cities regarding "*internal mobili[z]ation, formulating emission reduction goals and institutionalizing climate trajectories*" [original stress]. This is associated with the fact that the definition of emission reduction goals, climate trajectories or monitoring tools is often required by TMCNs for a city to become eligible for membership.

*Expectations.* Based on these preceding findings, the thesis at hand expects TMCN membership to positively affect a city's climate governance due to increased access to resources and opportunities for policy learning that coincide with network exchange. Membership is anticipated to be particularly effective by providing action- and policy incentives that foster policy learning. Further, it is assumed to promote internal mobilization towards climate action and the institutionalization of climate trajectories. TMCN membership is also anticipated to affect a member city's formulation of emissions reduction goals. Thus, the cities that portray at least one TMCN membership are expected to define more ambitious climate protection goals in their respective climate action plans.

*Increased Organizational Capacity to Access Funding.* While information and knowledge can be seen as crucial resources to leverage local climate action, TMCNs also enable members to access financial resources by providing increased organizational capacity. The network may facilitate coordination and exchange of member cities, enabling joint applications for project funding (Kern & Bulkeley, 2009, p. 321). As some resources or funding schemes from supranational organizations, such as the EU, or private entities might not be accessible for single cities, coordinated joint applications can increase a city's overall chances of receiving financial resources. At the same time, a network can alternatively directly bid for funding itself and allocate finances to initiated projects which can include certain members (Kern & Bulkeley, 2009, p. 321). While TMCNs do not provide funding to members directly, they can support joint applications, provide information on how to best apply for international funding schemes or channel resources for project funding which can ultimately benefit members.

*Expectation.* TMCN membership is expected to provide cities with increased organizational capacity regarding opportunities to secure funding for local climate protection initiatives.

*Legitimizing.* TMCNs are additionally argued to motivate climate initiative and to have a legitimizing function for climate action on the local level (Busch et al., 2018; Karhinen et al., 2021; Kern & Bulkeley, 2009). Membership is often used as a “source of external legitimacy” for local action (Kern & Bulkeley, 2009, p. 327) which can be especially instrumental for climate advocates in rather passive municipalities in periods of financial or political distress.

*Expectation.* If inspired by or associated with TMCN-related recommendations or incentives, an adopted local policy, or an anticipated initiative contained therein, is expected to be accompanied by increased legitimacy.

### **3. Methodology**

The following chapter describes and justifies the used methodology to answer the exploratory research question. Initially, the choice of research design is discussed. This is followed by a comprehensive description of the multilayered case selection which considers the German federal state under study, North-Rhine Westphalia, the choice of considered TMCNs and the final selection of three city samples within NRW, namely Bonn, Paderborn and Neuss. The chapter closes by elaborating on the chosen data collection and analysis approach.

#### **3.1 Research design**

This thesis asks: „How does TMCN membership impact the local climate governance of the North Rhine-Westphalian cities of Bonn, Paderborn, and Neuss?” To answer this research question and the initially formulated sub-questions, an exploratory case study research design is followed,

combining document analysis of the studied cities' respective climate action plans and expert interviews with municipal sustainability administrators.

Case studies are argued to serve the cause of studying a phenomenon in great detail and thus enabling theory-testing and -informing as well as contributing to theory development and refinement (George & Bennett, 2005). Yin defines case studies as “an empirical method that investigates a contemporary phenomenon [...] in depth and within its real-world context” (Yin, 2018, p. 45). A case study thus considers that an observed phenomenon and its context are bound together and might not be clearly distinguishable. It is argued to be beneficial when needing to cope with a “distinctive situation in which there will be many more variables of interest than data points” (Yin, 2018, p. 46). Due to its ability to generate more detailed knowledge of occurring processes, a case study approach is considered appropriate for this thesis as it aims to deepen the understanding of TMCN membership impact on local climate governance by engaging in a geographically focused, in-depth analysis of selected city units in NRW. Accordingly, the case study design is expected to help determine if and how cities can benefit from TMCN membership in their given contexts.

### **3.2 Case Selection**

The case selection for this thesis follows a mechanism resembling the shape of a funnel. Initially, a specific federal state, namely NRW, is identified as a particularly interesting German region to study with respect to climate governance. Subsequently, prominent TMCNs are reviewed that require consideration in the study's context. Lastly, a sample of three NRW cities is selected, determining the units of analysis.

#### **3.2.1 German Federal State of North Rhine-Westphalia (NRW)**

A geographically focused, sub-national analysis of a specific federal state is expected to promote more differentiated knowledge on which factors impact local climate governance of cities within a similar institutional framework. This is particularly attributed to the fact that Germany is a federal state which complies with the principle of subsidiarity. Therefore, each of the 16 'Bundesländer' has considerable competencies and autonomy in structuring their administrative systems surrounding large policy fields. Against this backdrop, the focus on one state allows holding constant on relevant institutional factors that might influence the respective cities' climate governance. Moreover, this geographical focus is applied to reduce strongly deviating political cultures and levels of climate change vulnerability which could impact local climate initiatives and lead to misinterpretation of network influence (see 2.2).

The federal state of NRW is considered particularly interesting in the context of this study for numerous reasons which are discussed in the following.



(TUBS, 2012)

With a population size of around 17.93 million inhabitants at the end of 2020, NRW is the most populous federal state in Germany (Statista, 2022b) and generated the largest GDP in 2021 compared to the other federal states (Statista, 2022a). This is mainly attributed to the fact that NRW displays the highest density of large cities in a federal state, meaning cities with more than 100.000 inhabitants (Statista, 2022c), as well as the highest density of resident companies in Germany (Statista, 2022a).

The area grew politically important as NRW represented the political heartland of West Germany before the German reunification in 1990. The city of Bonn functioned as the capital of West Germany during the German partition and, to date, continues to be home to numerous federal authorities and administrative bodies as well as UN organizations (Auswärtiges Amt, n.d.). It thus proceeds to be a location of national and international importance.

NRW's economy is historically strongly associated with mining and industry. Particularly the Ruhr region was economically dominated by coal mining and heavy industry (Land Nordrhein-Westfalen, n.d.). NRW has been undergoing broad structural changes since the 1960s to reduce the region's dependency on coal mining and the corresponding environmental impact. While NRW's

Ruhr region continues to be a significant industrial region in Europe, the federal-state is increasingly developing into a modern service location and thus broadening its sectoral focus (MWIDE NRW, n.d.).

NRW's historical concentration and economic dependency on the environmentally harmful coal and steel production and heavy industry accompanied by its current economic restructuring make it an interesting region to study regarding municipal climate governance. Previous research conducted in the US has determined a city or region's high dependency on manufacturing as an impeding factor for climate protection efforts due to the corresponding social and economic dependency on resource-intensive sectors (Krause, 2011b, p. 56). While NRW's current economic restructuring might initiate a change in social and political perception of environmental protection, the history and culture of industrial reliance remain. This makes it particularly interesting to explore if benefits previously associated with TMCN membership also become apparent in NRW's context.

The state's historically justified international orientation represents an additional motivation to study the current presence and impact of internationally cooperative TMCNs in NRW.

### **3.2.2 Considered TMCNs**

The three TMCNs accounted for in this thesis are the Climate Alliance, Covenant of Mayors and ICLEI. The concentration on these networks is based on findings from previous research.

Busch et al. (2018) identified the Climate Alliance and the Covenant of Mayors as the most dominantly occurring TMCNs in Germany on a national scale, generally portraying the highest number of members throughout the country. Analysis of membership status in NRW cities confirms this observation for the federal state (see Appendix 1).

The Covenant of Mayors mainly requires a city's mayoral commitment to a set of emissions reduction goals. The only requirement for joining the initiative is for the municipal council to adopt and sign the 'Covenant Commitment Document' and register the respective local authority online (Covenant of Mayors, 2021). A prominently associated commitment is to achieve carbon neutrality and city resilience by 2050 by reducing emissions and promoting a just energy transition. The signatories consent to "commit, engage, act and network" in pursuit of these objectives (Covenant of Mayors, n.d.). There is no participation fee associated as the initiative is voluntary and bottom-up.

Considering the Covenant's predominant nature as a commitment instrument, it is not expected to leverage substantial exchange mechanisms beneficial to local climate governance and policy learning. It is nonetheless considered due to its dominant occurrence among NRW cities and since respective goals might still inform and find entry into local climate action plans of signatory cities. Its consideration thus allows following the expectation that TMCNs particularly influence cities in formulating emissions reduction goals.

The Climate Alliance network was founded in 1990 in Frankfurt, Germany, and is currently "the largest European city network dedicated to climate action" (Climate Alliance, n.d.a). It is broadly



spread in the German-speaking world as German, Austrian and Swiss municipalities were the driving forces for its creation. However, the Climate Alliance now consists of nearly 2.000 European member municipalities and districts throughout almost all European countries. They are working in partnership with indigenous peoples inhabiting the Amazon River basin to promote climate justice and collectively work towards combatting climate change (Climate Alliance, n.d.a). Cities joining the network “must pass a municipal resolution committing itself to continually cut greenhouse gas emissions, aiming for a 95% reduction by 2050 (as compared to 1990 levels) in line with IPCC recommendations” (Climate Alliance, n.d.a). Moreover, the members are required to actively integrate the network’s principles of “fair, nature-based, local, resource-saving and diverse” climate action (Climate Alliance, n.d.e). While these conditions are general formal requirements to submit a membership request to the network, they are based on the local authority’s own commitments and can thus vary. Furthermore, becoming a member requires an annual fee which is calculated individually for each applicant municipality, depending on its population with a rate of €0.0077 per resident per year. However, it is capped at a maximum of €15.000 and indigenous peoples are excluded from any payment obligation (Climate Alliance, n.d.d). Due to these rather accommodating membership conditions, the network attracts rural towns and districts as well as large cities. While there are several national coordination offices which support and help members, the network’s international headquarters of the Climate Alliance Secretariat lies in Frankfurt due to Germany’s important position in the network’s founding process.

ICLEI has been determined as a globally influential network due to its large global infrastructure, stringent commitment requirements for membership (Krause, 2012) and its capacity to provide members with priority access to training programs, technical assistance, workshops and specialized consultancy services (ICLEI, n.d.a). ICLEI, founded in 1990, is a global network consisting of more than 2500 regional and local governments in over 125 countries dedicated to sustainable urban development (ICLEI, n.d.b). ICLEI Europe comprises members in Europe, the Middle East and West Asia and functions as a platform that enables members to connect with peers and access tools and resources that beneficially impact urban sustainability. The network’s European Secretariat is based in Freiburg, Germany, and Brussels (Belgium) and supports member advocacy and coordination. Members benefit from priority access to training programs, technical assistance, workshops and specialized consultancy services (ICLEI, n.d.a). Local governments or associations of local governments can become ICLEI members. Members accept ICLEI’s Charter including a set of goals and principles and are required to pay an annual fee that is determined by the locality’s population size and national per capita income (ICLEI, n.d.a).

This thesis does not aim to assess the individual networks’ performance but rather to explore the general influence that TMCN membership might have on local climate governance in NRW. It thus takes an exploratory city-level approach to analysis. Hence, a more elaborate examination of the networks’ defining characteristics such as “their territorial scope and their degree of functional specialization“ (Bulkeley et al., 2003, p. 242) is not deemed productive.

### 3.2.3 City units of Analysis

To finally select suitable units of analysis - namely cities, in this case - a comprehensive overview of membership status in the three selected TMCNs was established for all NRW cities with a minimum of 25.000 inhabitants. This was based on data published by the German Federal Statistical Office in 2021. An elaborate overview of the procedure, the identified cities and respective membership constellations is to be found in Appendix 1.

Following this overview, three criteria are applied for the final city sample selection. Firstly, a city's TMCN membership constellation, secondly, city size and thirdly, the existence and availability of a climate action plan.

Regarding TMCN memberships, case variation is anticipated to best allow for exploration of occurring TMCN impact while also considering alternatively influential factors for local climate governance. It is thus perceived as most suitable to compare three cities of the following membership constellations: One city with an exclusive Climate Alliance membership as it represents one of the most widespread network among NRW cities. A second city with simultaneous membership in all three considered networks and one city with no TMCN membership.

Based on the findings presented in Appendix 1 and these selection criteria, Neuss, Bonn and Paderborn are selected for analysis.

Neuss has a population of approximately 153.000 and serves as the city case with an exclusive Climate Alliance membership. It has a climate action plan available online (Stadt Neuss, 2013) and a revised version from 2020 (Stadt Neuss, 2020). Neuss became a member of the Climate Alliance in 2020 which makes it an interesting case to study as it is likely that people who were involved during the application are still present and might have good process memory of becoming a member and insight into current network exchange.

Bonn displays a population of approximately 330.000 and is a member of all three networks under study as well as displaying a publicly accessible climate action plan (Stadt Bonn, 2013).

Lastly, Paderborn has a population of approximately 151.000 and currently does not display any membership in the considered TMCNs. However, the city appears highly engaged in climate action and makes a comprehensive set of climate policy documents available online, including a climate action plan (Stadt Paderborn, 2016). Studying Paderborn's climate governance by reviewing its current action plan and gaining more detailed insight by means of expert interviews with city officials is expected to serve this research as a control case, helping to identify alternative resources and influential factors for local climate governance besides TMCN membership.

As all three cities display a population larger than 100.000 inhabitants which makes them, by definition, big cities, they are expected to be reasonably well comparable.

### 3.3 Data Collection

Regarding data collection, it is considered a need for case studies to rely on the use of multiple, integrated sources of evidence to appropriately navigate the complex phenomenon it investigates. This increases the study's ability to fulfil its purpose as an in-depth, contextual mode of inquiry which considers different angles (Yin, 2018). This is accounted for by combining the use of primary and secondary data. The thesis thus draws from two main sources of data: the studied cities' latest climate action plans and primary interview data gathered in semi-structured expert interviews with officials from each city. Accordingly, different modes of data collection are integrated to adequately answer the study's sub-questions and ultimately meet the overarching research objective.

The cities' climate action plans are identified via desk research and internet searches on the respective websites. It becomes apparent that each city provides an action plan titled 'Integriertes Klimaschutzkonzept' (IKK). These include the corresponding municipal climate protection goals as well as a comprehensive set of developed measures aiming at achieving these goals and thus particularly serve the answering of descriptive SQ1.

Additionally, primary data is gathered by conducting semi-structured expert interviews with administrative officials from each city who are identified to be involved in municipal climate governance. In the case of Bonn and Neuss, the interviewees have expertise regarding their city's TMCN memberships. In total, three interviews are conducted, one for every studied city. In Neuss, two experts simultaneously participate in one interview. The interviews are transcribed in original language (German), excluding sections of personal exchange, and anonymized to enable transparent referencing. An overview of the interviews is given in Appendix B.

The method of semi-structured interviews is applied. This grants respondents flexibility in answering questions and also allows for reactionary adjustments of questions by the interviewer to explore the studied field (Flick, 2009, p. 150). This serves the study's exploratory nature and best draws from the cities' variations in TMCN membership constellations. The interview data is anticipated to particularly serve the answering of the explanatory SQ2a. by gaining context-specific, expert insights on perceived TMCN benefits and their added value to local climate governance. The interviews are further expected to provide valuable insight into internal processes and conditions which either promote or hamper effective local climate governance beyond network involvement. This is particularly focused on in the interview with Paderborn's expert, considering that the city does not display a TMCN membership. Accordingly, the collected data is also oriented towards answering the exploratory SQ2b.

Generally, the preceding discussion of the theoretical framework and the accordingly derived expectations concerning TMCN benefits inform and direct the interview structures. I accordingly expected that access to resources and promoted policy learning through policy incentives (1), increased organizational capacity (2), and increased legitimacy (3) will emerge as beneficial associations with TMCN membership. Given the city variation and the subsequent need to customize

the concrete questions, the interviews were loosely structured in three main parts: First, network exchange and other prominent exchange partners and mechanisms are addressed. Secondly, a content component aimed at identifying impactful information and incentive sources for local climate governance. Lastly, influential funding sources were addressed to cover the expectations. The general interview guideline is attached in Appendix C.

To follow up on identified TMCN influences which emerge from the document and interview analysis, the data is supplemented with additional desk research.

### **3.4 Data Analysis**

The city documents and interview data are analyzed by means of qualitative content analysis. This approach enables the “nonnumerical examination and interpretation of observations, for the purpose of discovering underlying meanings and patterns of relationships” (Babbie, 2013, p. 390). Given the study’s exploratory approach, this procedure allows identification of occurring network impact on local climate governance. The formulated sub-questions and theoretically derived expectations on potential TMCN benefits inform and guide the analysis. This aims to direct the exploration of TMCN impacts on local policy development occurring in NRW cities.

## **4. Analysis and Discussion**

Directed by the sub-questions and theoretical expectations on TMCN benefits, the following chapter explores practical instances of TMCN impact on municipal climate governance in the studied cities. Based on the empirical data gathered, alternative factors which occur as influential for local climate protection efforts are further identified.

### **4.1 Formulation of Emissions Reduction Goals**

The expectation was derived that TMCN membership is particularly influential regarding a city’s formulation of emission reduction goals and institutionalizing climate protection trajectories. This assumption is investigated focusing on the studied cities’ most recently published climate action plans. The so-called ‘IKKs’ provide a comprehensive overview of formally adopted climate goals and corresponding climate protection measures thus allowing to explore potential TMCN influences on their development.

In its 2013 IKK, the city of Bonn commits to reducing municipal CO<sub>2</sub> emissions by 10% every five years compared to 1990 and per capita. Moreover, city-wide emissions are to be reduced by 50% by 2030, also with respect to 1990 and per capita. Achieving a long-term level of 2,5 tons of CO<sub>2</sub>-equivalent per inhabitant and year is a further commitment. Interestingly, the Climate Alliance is specifically referenced in the city’s written plan with respect to these goals as they overlap with

Bonn's membership commitments. Further referring to the Covenant of Mayors, Bonn institutionalizes its commitment to reduce the CO<sub>2</sub> emissions per inhabitant by 20% compared to 1990. Additionally, the city aims to reduce its municipal CO<sub>2</sub> emissions by a minimum of 40% by 2020 compared to 1990 and per capita, thus voluntarily exceeding the previous network-required commitments (Stadt Bonn, 2013).

When formulating its municipal emissions reduction goals, Neuss specifically references existing goals committed to on state and federal levels. Via the 'Klimaschutzplan 2050', adopted in 2016, the federal government formulated the midterm goal of reducing Germany's GHG emissions by at least 55% by 2030 compared to 1990, while aiming at the long-term goal of Germany being climate neutral by 2050. At the federal state level, a climate protection law was adopted in 2013, committing NRW to reduce its general GHG emissions by at least 80% compared to 1990. While referring to these goals, the city additionally aims at exceeding the federal goal of climate neutrality by stating Neuss' ambition to be climate neutral by 2035 (Stadt Neuss, 2020).

Paderborn's IKK from 2016 displays a commitment to reducing the municipal CO<sub>2</sub> emissions by 25% until 2030 compared to 2005. Further, the city commits to a long-term goal of CO<sub>2</sub> emissions reduction of 40% by 2050 compared to 2005 (Stadt Paderborn, 2016).

At first glance, TMCN membership does appear to inform municipal formulations of emissions reduction goals as seen in the case of Bonn, specifically referencing its membership commitments. However, considering the quantitative goals for each city it appears that Neuss currently displays the most ambitious goal, namely climate neutrality by 2035. However, Neuss' goals emerge from its 2020 updated version of its initial IKK developed in 2013. Given that Bonn and Paderborn's plans are considerably older, further investigation shows that both cities are currently also renewing their respective IKKs and there have since been commitments to climate neutrality by 2035 by both cities' councils in 2019 (Stadt Bonn, n.d.; Stadt Paderborn, n.d.). This shows that similar trends of emission reduction goals are apparent in each city regardless of their TMCN membership constellations. The expectation that cities with TMCN membership strive toward more ambitious climate protection goals accordingly cannot be confirmed for the studied cities.

#### **4.2 Internal Mobilization Towards Institutionalizing Climate Trajectories**

The previous investigation of quantitative emissions reduction goals did not uncover considerable differences between the cities, taking the differing publishing times of the IKKs into account and cross-referencing identified commitments with contemporary council decisions. Nonetheless, the IKK review reveals valuable insights on factors promoting the municipal institutionalization of climate trajectories.

When initially comparing the three cities' IKKs it becomes apparent that all follow a similar structure. They explicitly formulate emissions reduction goals as well as conduct a comprehensive inventory of GHG emissions and energy consumption in the respective municipal areas. Savings

and efficiency potentials as well as potential increases in the share of renewable energies in the electricity and heat supply are further assessed for each city. These inventories serve the eventual formulation of concrete action measures that are expected to promote the achievement of the formulated goals.

Interestingly, all three cities' initial IKKs were funded within the framework of a national funding scheme of the German Federal Environmental Ministry, the 'Nationale Klimaschutzinitiative' (NKI). The initiative was launched in 2008 and has since provided funding for diverse actors involved in climate protection, including German municipalities (BMWK, 2020). While Neuss' concept has been updated in 2020 and was not further subsidized, its renewed version emerged from the nationally funded plan formulated in 2013 (Interview Neuss).

Accordingly, all cities' plans were drafted following similar incentives and requirements, thus partly explaining the overlap in content and format. National funding schemes accordingly emerge as predominant incentives leveraging local action towards institutionalizing municipal climate trajectories.

### **4.3 TMCN-enabled tools benefitting climate governance**

While the German NKI predominantly mobilized the initial creation of municipal IKKs, TMCN-enabled tools are identified to have been beneficial during the development process of the concepts and concrete measures in all three cities.

To be eligible for funding via the NKI, IKKs are required to conduct a municipal energy consumption and emissions inventory (BMWK, 2020). This aims to enable the subsequent formulation of concrete climate protection measures and the evaluation of their anticipated effectiveness regarding emissions reduction.

Bonn and Paderborn's IKKs state the use of the 'EcoRegion' software tool for this purpose which was developed by the Climate Alliance in partnership with the company 'Ecospeed' (Stadt Bonn, 2013, p. 12; Stadt Paderborn, 2016, p. 9). The tool was specifically developed for municipalities and enables the simplified, standardized creation of energy- and CO<sub>2</sub> balances. It further allows for data to be updated annually thus enabling continuous monitoring. Additionally, the tool's standardized nature simplifies municipal comparisons between user cities and increases transparency (ECOSPEED, n.d.). 'EcoRegion' has therefore been determined as a suitable tool to create the balances required for IKKs to receive national funding. Simultaneously, it is recommended as a tool for the reporting required by the Covenant of Mayors and has been chosen by the European Energy Award as the recommended tool for participating municipalities to balance their energy consumption and CO<sub>2</sub> emissions (EEA, n.d.). Accordingly, while having emerged from a Climate Alliance partnership, the tool has since been recognized and integrated by various networks and municipal actors. Interestingly, Paderborn utilizes this tool despite not being a member of the Climate

Alliance. This indicates the spread of innovative tools that are created with network participation beyond mere members.

In Neuss' updated climate plan, it is stated that the city develops its emission and energy consumption balances according to the 'BISKO'-standards (Stadt Neuss, 2020, p. 8). The interview with respective experts reveals that Neuss currently integrates these standards via the Climate Alliance's tool 'Climate Protection Planner' (Interview Neuss). BISKO is the German municipal accounting standard of GHG emissions, developed specifically for German cities and first published in 2015. Following the increased demand for municipal emission balancing and the corresponding emergence of varying tools, the German federal environmental office initiated the development of the BISKO standard for German municipalities (Bundesumweltamt, 2020). The Climate Alliance was actively engaged in this process during its efforts of designing the 'Climate Protection Planner'. Now having integrated the German-wide BISKO standards, the Planner emerged as an advancement of the previous 'EcoRegion' tool and was launched in 2016. Users of the previous ECORegion tool can easily transfer their data to this renewed web-based software (Climate Alliance, n.d.c).

Interestingly, the development of the Planner under the participation of the Climate Alliance was funded via the NKI, the same national funding scheme which funded the creation of the studied cities' IKKs (Climate Alliance, n.d.c). Besides enabling municipal emissions and energy consumption balancing, the tool now also provides "comprehensive and up-to-date statistics, factors and other key figures, thus reducing data collection needs" (Climate Alliance, n.d.c). Furthermore, it now includes integrated benchmarking features, covering quantitative and qualitative climate action monitoring incentives, which allow cities to directly compare their state of local climate protection to that of other municipalities. This expanded version of the initial tool thus actively promotes comparison and local exchange which might ignite municipal policy learning.

This shows that innovative tools are not only co-developed and spread by TMCNs, the Climate Alliance in this case, but also advanced and adapted to domestic institutional changes, such as the BISKO development in Germany. Tools are further utilized by municipalities regardless of their Climate Alliance membership, as seen in Paderborn.

The interview with Bonn's expert reveals that Bonn further makes use of a monitoring and exchange tool initiated by an ICLEI partnership with the Carbon Disclosure Project (Interview Bonn). The 'Carbonn Centre Platform' is used to publish data on local climate action by participating entities around the world. The center makes available a unified and integrated reporting system for municipal climate action (carbonn Centre, n.d.).

The monitoring tool co-developed by the Climate Alliance is shaped along German standards and requirements. It thus actively benefits German municipalities and practically impacts their respective climate governance. The Carbonn platform specifically collects and displays data internationally, aiming at a global exchange of information and expertise. Bonn's interviewee assesses the global standardization and simplification of climate data as crucial to increasing global comparability and usability of well-functioning initiatives beyond state borders (Interview Bonn, p.3).

### **4.3 TMCN-enabled project support**

Each studied city's IKK further includes an analysis of the respective current transportation frameworks and develops targeted measures aimed at making transport in the respective urban area more sustainable. Among others, some measures developed aim at raising civil awareness for sustainable mobility alternatives. The Climate Alliance's campaign 'City Cycling' is integrated into each climate protection concept in this context. While participation in this widespread campaign appears likely for Bonn and Neuss as members of the Climate Alliance, it is interesting to observe that it is also integrated by the city of Paderborn without displaying a membership (Stadt Paderborn, 2016).

'City Cycling' is a citizen-oriented campaign promoting awareness for climate-friendly mobility. Municipal politicians and citizens are encouraged to cycle as many kilometers as possible over a consecutive 21 days. After the possible implementation period, the kilometers finally covered are compared leading to the best-performing participating municipalities being awarded. The campaign additionally grants participants access to an associated reporting platform named 'RADar!' which enables the reporting of identified problems and shortcomings in participating cities' cycling infrastructure. The campaign thus provides municipalities with a "communication, planning and citizen participation tool [which helps integrate] the interests of road users with road safety- and climate protection" concerns to eventually influence municipal decision-making (Climate Alliance, n.d.b). This exemplifies how network-enabled project support impacts climate governance in the transportation realm, mobilizing cities to take initiative for sustainable mobility alternatives to ultimately contribute to local climate protection.

### **4.5 Accessing information, expertise and policy inspiration for municipal climate governance**

The previous section showed that TMCN-enabled tools and project support can have direct implications for municipal policy development and for implementing climate protection initiatives. Based on the review of existing literature, the expectation was further derived that TMCN membership particularly benefits administrators in accessing information, either via recommendations directly or network-initiated exchange. TMCNs are thus expected to portray important sources of information as well as action and policy incentives. This in turn can initiate policy learning, impacting local climate governance.

Main information sources for policy development and inspiration were addressed in the expert interviews. The perceptions of this added value due to network membership diverge among the interviewed experts.



For Bonn, the interviewee portrays a particularly fruitful exchange initiated through its involvement with ICLEI. A frequent and regular exchange with ICLEI network staff is portrayed, resulting in Bonn's climate-related administrative offices regularly receiving relevant information. The exchange with ICLEI is argued to provide references to case examples of well-functioning and potentially beneficial climate protection initiatives from other municipalities. ICLEI staff also makes recommendations for corresponding contacts thus initiating relationships with other cities via the network structure (Interview Bonn). Simultaneously, the interviewee reports benefitting from best practices shared by the network as they provide Bonn with ideas and impulses which often find entrance into administrative discussions and are therefore considered in municipal climate protection policies. Additionally, Bonn is said to actively make use of consulting services via its ICLEI membership which benefits climate protection programs. Accordingly, the interviewee perceives ICLEI to provide the city with a "very interesting pool of information and [] capacities" [own translation] (Interview Bonn, p.6).

The close engagement and strong links between Bonn and ICLEI appear partly associated with the fact that Bonn is home to ICLEI's World Secretariat and Global Head of Advocacy as well as Bonn's lord mayor being an elected member of ICLEI's global executive committee, responsible for the climate action and low emissions development portfolio (ICLEI Global, n.d.). The interviewed expert underlines that a considerable amount of exchange and contribution is initiated via the mayor's mandate. While Bonn is a member of ICLEI Europe, the lord mayor's position in the global executive committee enables city delegates to, for example, regularly participate in ICLEI's world congresses thus expanding Bonn's network relationship considerably and again broadening its access to potential incentives.

Well-established mechanisms of cooperation between Bonn's administrative bodies and ICLEI become apparent. For instance, ICLEI and Bonn cooperatively organized the 10-year conference series 'Resilient Cities'. The resulting cooperation eventually led to the establishment of the local 'Bonn Network Civil Protection and Disaster Risk Reduction' (Interview Bonn). This exemplifies network exchange leveraging concrete local action for climate governance.

Moreover, in the run-up to the UN Conference of the Parties on Biodiversity in 2008, ICLEI coordinated a selected group of cities to enter a pilot project on local biodiversity in cooperation with the International Union for Conservation of Nature (IUCN) and several scientific organizations. This initiated the development and adoption of biodiversity strategies in the participating cities, including Bonn. The interviewee stresses that Bonn had a broad agglomeration of biodiversity and climate protection statutes and legislation before 2008. However, the ICLEI-initiated city project resulted in Bonn developing an integrated, comprehensive biodiversity strategy which increased transparency (Interview Bonn). Accordingly, network exchange practically and concretely impacted local policy development and adoption to promote environmental protection.

The interviewees representing Neuss display their Climate Alliance membership as less influential for acquiring information and expertise for local policy development. Important to consider, Neuss only recently joined the Climate Alliance in 2020. The interviewees in Neuss thus state that active network exchange has not yet emerged (Interview Neuss). This appears to partly explain the deviating perceptions in Bonn and Neuss.

However, Neuss interviewees' perceptions of relevant information sources accordingly largely coincide with those of Paderborn's interviewee, Paderborn currently not displaying any TMCN membership. In both cases, the interviewees stress the predominant administrative reliance on self-initiative in acquiring information relevant to local climate policy development and governance. They perceive regional exchange with neighboring municipalities as most important to identify well-functioning climate initiatives or measures that are simultaneously locally implementable in NRW's context (Interview Neuss & Paderborn). Instead of TMCNs distributing best practices or international exchange initiating policy learning, local proximity is argued to be most impactful in initiating a mechanism of imitation and promoting policy learning in a more local, regional context (Interview Neuss & Paderborn). Nonetheless, the exchange of best practices and effective measures is generally argued to be crucial as replicable ideas or projects can save public municipal finances (Interview Neuss). The search for information is displayed as regionally oriented and argued to always be topic-related in line with the city's present needs (Interview Neuss & Paderborn). Also on the receiving end, information and recommendations for innovative policy ideas are mainly provided by surrounding municipalities, regional scientific institutions and experts or local actors (Interview Neuss & Paderborn).

Considering that Paderborn is currently not a TMCN member, the respective interview took a particularly exploratory approach and produced some insights on practical action and policy benefits emerging from dialogue and beneficial exchange with surrounding municipalities and local experts.

For instance, Paderborn actively benefitted from existing expertise in another NRW city, Gütersloh, when pursuing the establishment of a municipal Climate Council. By means of self-initiative, Gütersloh was identified to have already established a Climate Council and was contacted to determine possibilities of integrating a similar initiative in Paderborn's municipal context (Interview Paderborn). Such regional exchange is argued to be most fruitful when searching for impactful but especially also implementable measures as municipalities within one state face the same institutional framework and regulatory conditions (Interview Paderborn).

Besides the exchange with other municipalities, local expert groups are further argued to provide climate action incentives beneficial to policy development. A fruitful exchange is described with the municipal energy supplier 'Westfalen Weser Netz'. In cooperation with the company's experts and other municipalities in its supply area, a mechanism was identified recognizing how a bylaw for the establishment of climate-neutral neighborhoods can be enacted that allows residents to deduct energy retrofits from their taxes (Interview Paderborn). Simultaneously, cooperation with

a local association of energy experts, the “energieXperten – Kompetenznetzwerk Paderborn e.V.”, was displayed as beneficial. The experts focusing on energy-efficient building and consultancy have contributed to Paderborn’s development of municipal measures on energy-efficiency construction standards (Interview Paderborn).

Evidently, the sources and exchange mechanisms providing action incentives and policy inspiration and thus promoting policy learning appear to be more regionally concentrated in Neuss and Paderborn than portrayed by Bonn’s expert.

#### **4.6 Advocacy**

Given the exploratory potential in semi-structured interviews, Bonn’s expert further stresses ICLEI’s beneficial advocacy function. Mandated by the Global Taskforce, ICLEI coordinates the advocacy of municipal governments in global climate negotiations and thus enables cities to collectively reinforce their voices in the international sphere to demonstrate municipal challenges and needs in tackling climate change (Interview Bonn). Increased advocacy has previously been positively associated with TMCN membership as internationally operating networks backed by an agglomerate of municipal leaders have a larger international capacity to influence the complex multilevel governance setting surrounding climate change (Bulkeley et al., 2003). This aspect of TMCN benefit was initially not included in theoretical considerations as it was not expected to practically impact local climate governance. However, being mentioned several times by Bonn’s interviewee, it must be considered as an added value occurring from TMCN membership.

#### **4.7 Activism, Local Interest Groups and Mobilization Towards Continued Climate Action**

Based on the previous theoretical elaborations, TMCN membership was further expected to positively affect internal mobilization towards municipal climate action.

Neuss was identified as a particularly interesting case in this context due to the close timespan in which the city became a member of the Climate Alliance and published its updated climate action plan in 2020. Good process memory was anticipated to help the identification of a possible relationship between the events. The aspect was thus addressed in the interview to follow up on the expectation that preparing a TMCN membership might initiate internal mobilization towards institutionalizing climate trajectories (Busch et al., 2018). However, the interviewees could not confidently identify such a connection (Interview Neuss). Alternatively, an influential factor mentioned for mobilizing action towards updating Neuss’ IKK is a phase of increased public interest in climate protection and the strong appearance of interest groups in 2019. Fridays for Future is highlighted as very active in this period and associated with leveraging the 2019 council decision on Neuss becoming climate neutral by 2035. This coincided with the initiation of redefining the IKK until 2020

with the active participation of experts, local stakeholders and civil society groups, including Fridays for Future (Interview Neuss).

Section 4.1 uncovered that climate neutrality until 2035 was respectively decided on in 2019 by Bonn and Paderborn's city councils. Additionally, both cities are currently also renewing their IKKs into updated climate action plans. All studied cities accordingly declared more ambitious climate protection goals and the corresponding continuation of their IKKs within a similar timespan.

When following up on this observation, Paderborn's expert also stresses municipal Fridays for Future protests as having created pressure for political response and administrative action. The council's decision in 2019 to revise the latest climate action plan is associated with civilian interest in increased climate protection and political pressure created by local interest groups and activism. Citizen participation via, for example, expanded online dialogue functions is therefore of great importance in the currently ongoing process of developing the new climate action plan for Paderborn. This provides an influential source of inspiration and action incentives to mobilize municipal climate action (Interview Paderborn).

Bonn's expert confirms the great importance of civil society actors in contributing to Bonn's council making a series of decisions in 2019, including declaring a climate emergency, committing to becoming climate neutral by 2035 and redefining the existing climate action plan accordingly to reach this objective (Interview Bonn). The 'Bonn for Future' movement and transformation initiative 'Bonn im Wandel' are explicitly named as having contributed to this political mobilization. They are currently also strongly involved in the administrative process of drafting the updated climate action plan by supporting the development of concrete ideas and measures (Interview Bonn). Besides civil interest groups, the interviewee highlights the importance of exchange with local and regional scientific institutions and experts to base climate protection goals on appropriate data. NRW's State Office for the Environment and the University of Dortmund are named as crucial initiators of continued climate action by providing Bonn with relevant scientific data that mobilized the council's decision to declare a climate emergency and update its IKK (Interview Bonn).

#### **4.8 Organizational capacity: Funding**

Further, it was theoretically derived that TMCN membership might increase organizational capacity, defined in terms of leveraging funding opportunities.

Based on the interview data gathered, this expectation cannot be supported for Bonn or Neuss, despite displaying TMCN membership. Neither Bonn's nor Neuss' experts can recall direct TMCN support - in terms of provided consultancy opportunities – for filing previous funding applications. Moreover, potential opportunities to leverage network exchange to initiate joint funding applications among member cities are associated with high coordination requirements and administrative burdens (Interview Bonn & Neuss). Bonn's expert does state that Bonn has previously

benefitted from EU funding. However, network support in the application process cannot be confirmed (Interview Bonn).

Since coordinative processes are evaluated as time- and resource-consuming, the studied cities have to date mainly focused on accessing state and federal-level funding opportunities for concrete, individual municipal projects (Interview Bonn, Paderborn & Neuss).

Climate protection does not fall under cities' obligations regarding the municipal provision of basic services in Germany. Therefore, municipal financial resources in this policy area are strongly limited (Interview Paderborn). State and federal-level funding schemes have accordingly been established to support municipalities in promoting climate action. Corresponding funding schemes thus emerge as the most dominant incentives for climate action while TMCN involvement in applying for funding cannot be observed.

This is supported by the previous finding that all studied cities received national funding via the NKI scheme to develop their initial IKKs (see 4.2). However, in the process of developing these concepts, the cities all benefitted from a monitoring tool which was co-developed by the Climate Alliance (see. 4.3). Noteworthy, the development of the tool's latest version, the 'Climate Protection Planner', was also funded via the German NKI funding scheme. Accordingly, the Climate Alliance was able to leverage national funding for project support to create a tool which eventually benefitted the studied cities. Also, the resulting benefit is not exclusively applicable to the cities displaying membership as seen in the case of Paderborn.

#### **4.9 Legitimacy**

While difficult to pinpoint via the expert interviews, no evidence becomes apparent that confirms the expectation of TMCN's increasing legitimacy for local climate action.

Overall, all interviewees argue that concrete local climate action is perceived as legitimate when a substantial benefit for the respective municipality and its citizenship is made apparent. Neuss' interviewees stress that the positive practical implication of a proposed measure is of most importance. A TMCN reference to a suggested climate protection initiative is perceived as rather irrelevant when entering political discussion (Interview Neuss).

While this coincides with general observations in the other cities, Bonn's interviewee does hint toward openness on the part of the responsible political panel if an internationally operating network or organization presents a climate protection program or suggests a project or measure. It is stated that there have been occasions on which ICLEI staff directly addressed political panels in Bonn with sustainability concerns (Interview Bonn). Accordingly, TMCN incentives could increase the perceived legitimacy of subsequent local climate action. However, this observation appears unique in Bonn's context, considering its position as the home to ICLEI's world secretariat and the subsequent local proximity of ICLEI- and municipal entities.

## 5. Conclusion

This thesis set out to answer the overarching research question:

*„How does TMCN membership impact the local climate governance of the North Rhine-Westphalian cities of Bonn, Paderborn, and Neuss?“*

Following this question, the study took an exploratory case study approach to gain in-depth insights into practical instances of TMCN impact on the studied cities' climate governance. By drawing from explicitly formulated climate protection measures in the cities' climate action plans (IKKs) and conducting expert interviews, TMCN impact was identified in a varying set of categories.

### 5.1 General Conclusions

Answering the research question, the most prominent finding is that TMCNs influence municipal climate governance of NRW cities by developing and distributing useful tools and by contributing to municipal climate protection initiatives by means of project support.

In the studied NRW context, the Climate Alliance appears particularly influential in this regard. This becomes apparent from analyzing the studied cities' IKKs. The Climate Alliance was actively engaged in co-developing and distributing a tool enabling standardized municipal inventories of emissions and energy consumption. All three cities' apply the respective ECORegion tool, or later Climate Protection Planner, to develop their respective inventories. These in turn are required by the NKI funding scheme to receive national funding for the development of climate plans which institutionalize municipal climate trajectories. Accordingly, the TMCN-enabled tool practically benefits municipalities' climate governance. Interestingly, the tool has been periodically updated, leading to the current 'Climate Protection Planner' actively integrating the German BSKO-standards for municipal emissions- and energy balancing. Accordingly, the Climate Alliance does not only provide useful tools but also supports user cities in adapting to domestic institutional changes.

Moreover, the studied cities all participate in the Climate Alliance's 'City Cycling' campaign. The TMCN thus additionally provides project support which can benefit local climate governance by mobilizing civil engagement and producing practical incentives to improve infrastructure for sustainable mobility alternatives such as cycling. Citizens and politicians of participating municipalities gather infrastructural data via the integrated reporting platform 'RADar' to display infrastructural shortcomings as part of the campaign.

Accordingly, the Climate Alliance produces and makes available tools and projects that are citizen-oriented and locally implementable in NRW municipalities. Considering the Climate Alliance is the most widespread TMCN in NRW, these positive findings are expected to be generalizable across the federal state. This is further supported referring to Paderborn, as it becomes visible that the identified tools and projects supported by the Climate Alliance are not exclusively beneficial for network members.

Based on previous theoretical elaborations, TMCNs were further expected to be impactful regarding the provision of information, expertise and policy incentives. Corresponding mechanisms were positively identified for the case of Bonn regarding its ICLEI membership. Most interestingly, an ICLEI invitation to participate in an international city pilot project on biodiversity eventually led to the development of a comprehensive Biodiversity strategy for the city, integrating previously dispersed legislation and initiatives. This exemplifies concrete local policy development being leveraged by TMCN incentives. In the cases of Paderborn and Neuss, however, local and regional exchange mechanisms and information sources emerge as the most influential for local climate action and policy development. Exchanges with neighboring municipalities, regional scientific entities, local expert groups and municipal interest and activist groups are displayed as most instrumental in providing information and incentive for local policy development.

Derived from the interview with Bonn's expert, another identified added value emerging from ICLEI membership is the network's capacity to increase advocacy for municipal climate matters in the international sphere. While increased city advocacy helps cities to make needs heard in the multilevel global climate governance setting, this beneficial aspect does not seem to practically impact NRW cities' climate governance in general. It appears more relevant for prominent network actors, such as Bonn with respect to ICLEI. Nonetheless, increased advocacy must be generally acknowledged as an added value associated with ICLEI membership.

TMCN membership was further expected to leverage internal mobilization towards formulating emissions reduction goals and institutionalizing climate protection trajectories. Bonn and Neuss do actively reference emissions reduction commitments of their respective TMCN memberships in their published IKKs. However, continued institutionalization of climate trajectories appears otherwise impacted, not being specifically associated with TMCN membership. All three cities under study display a period of internal mobilization in 2019, committing to climate neutrality by 2035 and deciding to respectively redefine the existing IKKs. This trend towards continued climate action thus emerges simultaneously for each city studied. The interviewed experts all link the respective internal mobilization towards deciding on redefining institutionalized climate trajectories with an increase in public pressure on municipal climate protection. Rather than TMCN membership, local interest and activist groups thus appear as most influential in promoting continued local climate action.

Lastly, TMCN membership was expected to be positively associated with a city's ability to access funding and with increasing legitimacy of local climate action.

Regarding legitimacy, no substantial evidence could be derived from the expert interviews that would confirm the expectation of TMCN involvement increasing the perceived legitimacy of a climate protection measure or initiative. TMCNs might be internationally recognized by other key organizations and thus able to advocate cities' interests and legitimize the general inclusion of cities' needs into considerations of global, and international climate governance. However, this aspect appears less influential on the local, city-level of climate action.

Concerning funding, neither Bonn's nor Neuss' interviewed experts recall a previous funding application having been supported via a TMCN membership and respective consultancy services. Moreover, joint applications among network members are associated with high administrative and coordinative burdens thus not being pursued despite possible TMCN support. Accordingly, the studied member cities do not appear to have recently directly benefitted from network support in filing applications for funding. Nonetheless, all studied cities make use of a network-enabled tool to conduct their municipal emissions and energy inventories. To develop the 'Climate Protection Planer' tool, the Climate Alliance channeled funding via the German NKI funding scheme. Accordingly, TMCNs do appear to provide implicit benefits with respect to funding opportunities, considering their capacity to secure project funding to produce tools which later benefit municipal climate governance.

## **5.2 Research Limitations and Outlook for Future Research**

In view of the decision to choose cities with varying membership constellations in the considered TMCNs, the thesis did not set out to assess the individual networks' performance. Instead, occurring TMCN impacts are exploratively identified to study how transnational climate policy networks can practically influence climate governance in NRW cities. While concrete influences were identified and partially coincide within the cities, the exploratory case study approach makes the findings difficult to generalize. Since findings are directly dependent on each city's specific context, their generalizability and external validity are limited.

Particularly in the case of Bonn, beneficial impacts occurring from its ICLEI membership appear to be specific to the city's context. Firstly, ICLEI membership is the least widespread among NRW cities (see Appendix A). Associated benefits are thus difficult to generalize throughout the federal state. Additionally, observed ICLEI impacts are particularly associated with Bonn's close relation to ICLEI as the seat of the network's Global Secretariat and Global Head of Advocacy. In this context, the respective interviewee stresses that international exchange is part of Bonn's culture (Bonn Interview). Bonn's close involvement with ICLEI and its generally strong focus on international exchange might be predominantly related to its historically justified international orientation, which is rather unique in the NRW context. This observation implies that a city's political culture might impact its choice of TMCN membership, its respective degree of involvement and perception of related benefits.

Accordingly, it might be interesting for future research to include internal city characteristics more actively when considering factors that either promote or impede TMCN impact. Besides political culture, these might also cover a city's partisanship, population, general revenue and education levels. Corresponding components could be integrated to enable a more systematic and comprehensive analysis of factors that impact local climate governance. While mentioned components were previously identified as positively associated with policy diffusion in section 2.2, their more systematic inclusion in the analysis exceeded the scope of this exploratory project.



Regarding missing data, it must be stated that the expert interviewed in Bonn portrayed specific expertise regarding the cities' relationship with ICLEI. The supervision of Bonn's Climate Alliance membership and corresponding exchange is within the remit of another expert. While efforts were therefore made to conduct a second interview, the inquiry was rejected due to limited capacities. However, this is not perceived to have affected the research as the interviews generally explored instances of practical TMCN impact on local climate governance. A network-specific performance assessment was not sought after in line with the study's exploratory research objective.

While a simultaneous interview was secured with two experts in Neuss, it became apparent that a comprehensive assessment of its Climate Alliance membership was difficult, given its recency in 2020. While this was anticipated to allow for good process memory of the application and preparation process for membership, it impeded the exploration of possible exchange mechanisms as they have not yet been actively established. Nonetheless, Neuss' interview enabled the further exploration of alternative impactful factors along with Paderborn's and confirmed the city's use of Climate Alliance tools and project support.

It is acknowledged that the applied exploratory approach did not allow for the assessment and comparison of the networks' individual performances. However, such insight might provide cities with concrete information for practice, e.g. insights into which networks are most successful in a certain region and thus worth joining to leverage associated benefits. Systematic performance assessments of individual networks in a certain geographical region might thus provide corresponding cities with valuable information. This could be additionally considered in future research.

## 6. References

- Acuto, M., Morissette, M., & Tsouros, A. (2017). City Diplomacy: Towards More Strategic Networking? Learning with WHO Healthy Cities. *Global Policy*, 8(1), 14–22. <https://doi.org/10.1111/1758-5899.12382>
- Agranoff, R., & McGuire, M. (2001). Big Questions in Public Network Management Research. *Journal of Public Administration Research and Theory*, 11(3), 295–326. <https://doi.org/10.1093/oxfordjournals.jpart.a003504>
- Auswärtiges Amt. (n.d.). *Die Vereinten Nationen in Deutschland*. Ständige Vertretung der Bundesrepublik Deutschland bei den Vereinten Nationen. Retrieved May 15, 2022, from <https://new-york-un.diplo.de/un-de/deutschlandvn/vn-in-deutschland/983196>
- Babbie, E. R. (2013). *The practice of social research* (Thirteenth edition). Wadsworth Cengage Learning.
- BMWK. (2020, August 6). *Ziele und Aufgaben der Nationalen Klimaschutzinitiative*. Nationale Klimaschutzinitiative des Bundesministeriums für Wirtschaft und Klimaschutz. <https://www.klimaschutz.de/de/ueber-die-initiative/ziele-und-aufgaben>
- Börzel, T. A. (1998). Organizing Babylon—On the Different Conceptions of Policy Networks. *Public Administration*, 76(2), 253–273. <https://doi.org/10.1111/1467-9299.00100>
- Budd, L., & Sancino, A. (2016). A Framework for city leadership in multilevel governance settings:

The comparative contexts of Italy and the UK. *Regional Studies, Regional Science*, 3(1), 129–145. <https://doi.org/10.1080/21681376.2015.1125306>

Bulkeley, H., Davies, A., Evans, B., Gibbs, D., Kern, K., & Theobald, K. (2003). Environmental Governance and Transnational Municipal Networks in Europe. *Journal of Environmental Policy & Planning*, 5(3), 235–254. <https://doi.org/10.1080/1523908032000154179>

Bundesumweltamt. (2020). *Weiterentwicklung des kommunalen Bilanzierungsstandards für THG-Emissionen Bilanzierungssystematik kommunal – BSKO Abschlussbericht*. [https://www.umweltbundesamt.de/sites/default/files/medien/479/publikationen/cc\\_19-2020\\_endbericht\\_sv-gutachten\\_bisko.pdf](https://www.umweltbundesamt.de/sites/default/files/medien/479/publikationen/cc_19-2020_endbericht_sv-gutachten_bisko.pdf)

Busch, H., Bendlin, L., & Fenton, P. (2018). Shaping local response – The influence of transnational municipal climate networks on urban climate governance. *Urban Climate*, 24, 221–230. <https://doi.org/10.1016/j.uclim.2018.03.004>

carbonn Centre. (n.d.). *The carbonn Center. Supporting cities, towns and regions tackling climate change to create transparency, accountability and credibility*. <https://carbonn.org/>

Climate Alliance. (n.d.a). *Climate Alliance—About us*. Climate Alliance. <https://www.climatealliance.org/about-us.html>

Climate Alliance. (n.d.b). *Climate Alliance—CITY CYCLING*. <https://www.climatealliance.org/activities/campaigns/city-cycling.html>

Climate Alliance. (n.d.c). *Climate Alliance—Climate Protection Planner*. <https://www.climatealliance.org/activities/projects/climate-protection-planner.html>

Climate Alliance. (n.d.d). *Climate Alliance—Join us*. Climate Alliance. <https://www.climatealliance.org/municipalities/join-us.html>

Climate Alliance. (n.d.e). *Climate Alliance—Principles*. Climate Alliance. <https://www.climatealliance.org/about-us/principles.html>

Covenant of Mayors. (2021). *CoM - Europe FAQs*. <https://eumayors.eu/images/FAQs-2021.pdf>

Covenant of Mayors. (n.d.). *About the Covenant of Mayors—Objectives & Scope*. Covenant of Mayors for Climate & Energy EUROPE. <https://www.covenantofmayors.eu/about/covenant-initiative/objectives-and-scope.html>

ECOSPEED. (n.d.). *ECORegion. Die Lösung zur effizienten Energie- und Treibhausgasbilanzierung für Städte und Gemeinden*. <https://www.ecospeed.ch/eco2region/data/ECORegion-2.pdf>

EEA. (n.d.). *European Energy Award: ECOSPEED Region*. <https://www.european-energy-award.de/european-energy-award/kooperationen/ecospeed-region>

Flick, U. (2009). *An introduction to qualitative research*. SAGE.

George, A. L., & Bennett, A. (2005). *Case studies and theory development in the social sciences*. MIT Press.

Heikkinen, M., Karimo, A., Klein, J., Juhola, S., & Ylä-Anttila, T. (2020). Transnational municipal networks and climate change adaptation: A study of 377 cities. *Journal of Cleaner Production*, 257, 1–9. <https://doi.org/10.1016/j.jclepro.2020.120474>

ICLEI. (n.d.a). *ICLEI - Membership Brochure*. [https://iclei-europe.org/fileadmin/user\\_upload/Members/Join\\_ICLEI/Membership\\_Documents/Membership\\_Brochure/EN\\_ICLEI-ES-2017-membership-leaflet.pdf](https://iclei-europe.org/fileadmin/user_upload/Members/Join_ICLEI/Membership_Documents/Membership_Brochure/EN_ICLEI-ES-2017-membership-leaflet.pdf)

ICLEI. (n.d.b). *ICLEI Local Governments for Sustainability Europe*. <https://iclei-europe.org/>

ICLEI Global. (n.d.). *Our leadership – ICLEI. Global Executive Committee*. <https://iclei.org/our->

leadership/

- Jagers, S. C., & Stripple, J. (2003). Climate Governance Beyond the State. *Global Governance*, 9(3), 385–399.
- Kammerer, M., & Namhata, C. (2018). What drives the adoption of climate change mitigation policy? A dynamic network approach to policy diffusion. *Policy Sciences*, 51, 477–513. <https://doi.org/10.1007/s11077-018-9332-6>
- Karhinen, S., Peltomaa, J., Riekkinen, V., & Saikku, L. (2021). Impact of a climate network: The role of intermediaries in local level climate action. *Global Environmental Change*, 67, 102225. <https://doi.org/10.1016/j.gloenvcha.2021.102225>
- Kern, K., & Bulkeley, H. (2009). Cities, Europeanization and Multi-level Governance: Governing Climate Change through Transnational Municipal Networks\*. *JCMS: Journal of Common Market Studies*, 47(2), 309–332. <https://doi.org/10.1111/j.1468-5965.2009.00806.x>
- Krause, R. M. (2011a). Policy Innovation, Intergovernmental Relations, and the Adoption of Climate Protection Initiatives by U.S. Cities. *Journal of Urban Affairs*, 33(1), 45–60. <https://doi.org/10.1111/j.1467-9906.2010.00510.x>
- Krause, R. M. (2011b). Symbolic or Substantive Policy? Measuring the Extent of Local Commitment to Climate Protection. *Environment and Planning C: Government and Policy*, 29(1), 46–62. <https://doi.org/10.1068/c09185>
- Krause, R. M. (2012). An Assessment of the Impact that Participation in Local Climate Networks Has on Cities' Implementation of Climate, Energy, and Transportation Policies: Local Climate Network Impact. *Review of Policy Research*, 29(5), 585–604. <https://doi.org/10.1111/j.1541-1338.2012.00582.x>
- Land Nordrhein-Westfalen. (n.d.). *Geschichte des Landes Nordrhein-Westfalen | Land.NRW*. Die Landesregierung Nordrhein-Westfalen. Retrieved May 15, 2022, from <https://www.land.nrw/geschichte-des-landes-nordrhein-westfalen>
- MWIDE NRW. (n.d.). *Wirtschaft in NRW | WIRTSCHAFT.NRW*. <https://www.wirtschaft.nrw/wirtschaft-nrw>
- O'Toole, L. J. (1997). Treating Networks Seriously: Practical and Research-Based Agendas in Public Administration. *Public Administration Review*, 57(1), 45. <https://doi.org/10.2307/976691>
- Otto, A., Kern, K., Haupt, W., Eckersley, P., & Thieken, A. H. (2021). Ranking local climate policy: Assessing the mitigation and adaptation activities of 104 German cities. *Climatic Change*, 167(5), 1–23. <https://doi.org/10.1007/s10584-021-03142-9>
- Provan, K. G., Fish, A., & Sydow, J. (2007). Interorganizational Networks at the Network Level: A Review of the Empirical Literature on Whole Networks. *Journal of Management*, 33(3), 479–516. <https://doi.org/10.1177/0149206307302554>
- Rogers, E. M. (2003). *Diffusion of innovations* (5th ed). Free Press.
- Rosenthal, C. S., Rosenthal, J. A., Moore, J. D., & Smith, J. (2015). Beyond (and Within) City Limits: Climate Policy in an Intergovernmental System: Climate Policy in an Intergovernmental System. *Review of Policy Research*, 32(5), 538–555. <https://doi.org/10.1111/ropr.12136>
- Rosenzweig, C., Solecki, W., Hammer, S. A., & Mehrotra, S. (2010). Cities lead the way in climate-change action. *Nature*, 467, 909–911. <https://doi.org/10.1038/467909a>
- Stadt Bonn. (2013). *INTEGRIERTES KLIMASCHUTZ- UND KLIMAANPASSUNGSKONZEPT. ENDBERICHT: TEILBEREICHE ENERGIE UND MOBILITÄT*. <https://www.bonn.de/themen-entdecken/umwelt-natur/klimaschutzkonzepte-und-berichte.php>

- Stadt Bonn. (n.d.). *Klimaschutzkonzepte und -berichte*. Bundesstadt Bonn. <https://www.bonn.de/themen-entdecken/umwelt-natur/klimaschutzkonzepte-und-berichte.php>
- Stadt Neuss. (2013). *Integriertes Klimaschutzkonzept für die Stadt Neuss*. [https://www.neuss.de/leben/umwelt-und-gruen/klima-und-energie/konzepte-fachinformationen/integriertes-klimaschutzkonzept/ikk-neuss\\_mai-2013.pdf](https://www.neuss.de/leben/umwelt-und-gruen/klima-und-energie/konzepte-fachinformationen/integriertes-klimaschutzkonzept/ikk-neuss_mai-2013.pdf)
- Stadt Neuss. (2020). *Neuss 2035 Klimaneutral. Fortschreibung des Integrierten Klimaschutzkonzeptes für die Stadt Neuss*. <https://www.neuss.de/leben/umwelt-und-gruen/klima-und-energie/konzepte-fachinformationen/integriertes-klimaschutzkonzept/entwurf-integriertes-klimaschutzkonzept.pdf>
- Stadt Paderborn. (2016). *Integriertes Klimaschutzkonzept der Stadt Paderborn*. <https://www.paderborn.de/wohnen-soziales/umwelt-gruen/klimaschutzkonzept-der-stadt-paderborn.php>
- Stadt Paderborn. (n.d.). *CO<sub>2</sub>-Neutralität 2035*. Stadt Paderborn. <https://www.paderborn.de/wohnen-soziales/umwelt-gruen/co2-neutralitaet-2035.php>
- Statista. (2022a). *Bruttoinlandsprodukt in Deutschland nach Bundesländern 2021*. Statista. <https://de-statista-com.ezproxy2.utwente.nl/statistik/daten/studie/36889/umfrage/bruttoinlandsprodukt-nach-bundeslaendern/>
- Statista. (2022b). *Einwohnerzahl der Bundesländer 2020*. Statista. <https://de-statista-com.ezproxy2.utwente.nl/statistik/daten/studie/71085/umfrage/verteilung-der-einwohnerzahl-nach-bundeslaendern/>
- Statista. (2022c). *Großstädte nach Bundesländern*. Statista. <https://de-statista-com.ezproxy2.utwente.nl/statistik/daten/studie/1244003/umfrage/grossstaedte-nach-bundeslaendern/>
- Statistisches Bundesamt. (2021). *Daten aus dem Gemeindeverzeichnis. Städte in Deutschland nach Fläche, Bevölkerung und Bevölkerungsdichte*. [https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwihl9GftMD3AhWFvaQKHcZrCFcQFnoECAUQAQ&url=https%3A%2F%2Fwww.destatis.de%2FDE%2FThemen%2FLaender-Regionen%2FRegionales%2FGemeindeverzeichnis%2FAdministrativ%2F05-staedte.xlsx%3F\\_\\_blob%3DpublicationFile&usg=AOvVaw3ILEGrnP35OHGg-QmAaTmb](https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwihl9GftMD3AhWFvaQKHcZrCFcQFnoECAUQAQ&url=https%3A%2F%2Fwww.destatis.de%2FDE%2FThemen%2FLaender-Regionen%2FRegionales%2FGemeindeverzeichnis%2FAdministrativ%2F05-staedte.xlsx%3F__blob%3DpublicationFile&usg=AOvVaw3ILEGrnP35OHGg-QmAaTmb)
- True, J., & Mintrom, M. (2001). Transnational Networks and Policy Diffusion: The Case of Gender Mainstreaming. *International Studies Quarterly*, 45(1), 27–57. <https://doi.org/10.1111/0020-8833.00181>
- TUBS. (2012). *Deutsch: Karte der politischen Gliederung von Nordrhein-Westfalen*. Own work This W3C-unspecified vector image was created with Adobe Illustrator. This SVG file was uploaded with Commonist. This vector image includes elements that have been taken or adapted from this file: North Rhine-Westphalia location map 06.svg (by TUBS). [https://commons.wikimedia.org/wiki/File:Nordrhein-Westfalen,\\_administrative\\_divisions\\_-\\_de\\_-\\_colored.svg](https://commons.wikimedia.org/wiki/File:Nordrhein-Westfalen,_administrative_divisions_-_de_-_colored.svg)
- United Nations. (2019, October 11). *Guterres: “Cities Are Where the Climate Battle Will Largely Be Won or Lost”* | UNFCCC. United Nations Climate Change. <https://unfccc.int/news/guterres-cities-are-where-the-climate-battle-will-largely-be-won-or-lost>
- Yin, R. K. (2018). *Case study research and applications: Design and methods* (Sixth edition). SAGE.
- Zahran, S., Brody, S. D., Vedlitz, A., Grover, H., & Miller, C. (2008). Vulnerability and Capacity: Explaining Local Commitment to Climate-Change Policy. *Environment and Planning C: Government and Policy*, 26(3), 544–562. <https://doi.org/10.1068/c2g>

Zahran, S., Grover, H., Brody, S. D., & Vedlitz, A. (2008). Risk, Stress, and Capacity: Explaining Metropolitan Commitment to Climate Protection. *Urban Affairs Review*, 43(4), 447–474. <https://doi.org/10.1177/1078087407304688>

## 7. Appendix

### Appendix A. TMCN Membership in all NRW cities with a population larger than 25.000 inhabitants

To inform the city case selection, a comprehensive overview of membership status in the three selected TMCNs was established for all NRW cities with a minimum of 25.000 inhabitants.

Based on data published by the German Federal Statistical Office in 2021, a total of 272 cities were registered in NRW in 2020 (Statistisches Bundesamt, 2021). Out of these cities, 169 cities were identified to have a population larger than 25.000 inhabitants and were subsequently analyzed regarding their TMCN memberships using the membership data available on the networks' websites.

In total, 81 out of these cities do not have a membership in any of the studied networks. Accordingly, 88 cities display at least one network membership.

In total, 86 cities display membership in the Climate Alliance network. 66 of these cities show an exclusive membership in the network, without being part of any of the other two networks.

20 cities show adhesion to the Covenant of Mayors, while only 3 cities -namely Duisburg, Bottrop and Arnsberg- display an exclusive membership. The other 17 cities are additionally members of the Climate Alliance network.

A total of 5 cities are members of ICLEI, none of which are exclusive members of the network. Bonn and Münster are additionally members of the Climate Alliance as well as the Covenant of Mayors and thus the only two cities engaged in all three networks under study. The other ICLEI members, Detmold, Beckum and Haan, have a second membership in the Climate Alliance network.

*Color Legend:*

Climate Alliance Membership

Covenant of Mayors Adhesion

ICLEI Membership

No Membership in selected TMCNs

CITY	POPULATION	NETWORK MEMBERSHIP
<b>KÖLN</b>	1 083 498	Climate Alliance (1993)
<b>DÜSSELDORF</b>	620 523	Climate Alliance (2008)/

		<b>Covenant of Mayors</b> (Adhesion 2010)
<b>DORTMUND</b>	587 696	<b>Climate Alliance</b> (1993)/ <b>Covenant of Mayors</b> (Adhesion 2009)
<b>ESSEN</b>	582 415	<b>Climate Alliance</b> (1993)/ <b>Covenant of Mayors</b> (Adhesion 2010)
<b>DUISBURG</b>	495 885	<b>Covenant of Mayors</b> (Adhesion 2010)
<b>BOCHUM</b>	364 454	<b>Climate Alliance</b> (1993)
<b>WUPPERTAL</b>	355 004	<b>Climate Alliance</b> (1992)/ <b>Covenant of Mayors</b> (Adhesion 2014)
<b>BIELEFELD</b>	333 509	<b>Climate Alliance</b> (1995)/ <b>Covenant of Mayors</b> (Adhesion 2008)
<b>BONN</b>	330 579	<b>Climate Alliance</b> (1995)/ <b>Covenant of Mayors</b> (Adhesion 2009) <b>ICLEI (2000)</b>
<b>MÜNSTER</b>	316 403	<b>Climate Alliance</b> (1995)/ <b>Covenant of Mayors</b> (Adhesion 2008) <b>ICLEI (1995)</b>
<b>MÖNCHENGLADBACH</b>	259 665	<b>Climate Alliance</b> (2009)
<b>GELSENKIRCHEN</b>	259 105	<b>Climate Alliance</b> (2008)
<b>AACHEN</b>	248 878	<b>Climate Alliance</b> (1991)/ <b>Covenant of Mayors</b> (Adhesion 2009)
<b>KREFELD</b>	226 844	
<b>(NO TMCN MEMBERSHIP)</b>		
<b>OBERHAUSEN</b>	209 566	<b>Climate Alliance</b> (1998)/ <b>Covenant of Mayors</b> (Adhesion 2018)
<b>HAGEN</b>	188 687	<b>Climate Alliance</b> (1994)/ <b>Covenant of Mayors</b> (Adhesion 2011)
<b>HAMM</b>	178 967	<b>Climate Alliance</b> (1993)
<b>MÜLHEIM AN DER RUHR</b>	170 921	<b>Climate Alliance</b> (1993)/ <b>Covenant of Mayors</b> (Adhesion 2016)
<b>LEVERKUSEN</b>	163 905	<b>Climate Alliance</b> (1995)
<b>SOLINGEN</b>	159 193	<b>Climate Alliance</b> (1993)
<b>HERNE</b>	156 940	

<b>(NO MEMBERSHIP)</b>	<b>TMCN</b>	
<b>NEUSS</b>		153 109 <b>Climate Alliance</b> (2020)
<b>PADERBORN</b>		151 864
<b>(NO MEMBERSHIP)</b>	<b>TMCN</b>	
<b>BOTTROP</b>		117 388 <b>Covenant of Mayors</b> (Adhesion 2011)
<b>BERGISCH GLADBACH</b>		111 636
<b>(NO MEMBERSHIP)</b>	<b>TMCN</b>	
<b>REMSCHIED</b>		111 516 <b>Climate Alliance</b> (1995)
<b>RECKLINGHAUSEN</b>		110 705 District of Recklinghausen (615.260 pop.) <b>Climate Alliance</b> (2001)
<b>MOERS</b>		103 487
<b>(NO MEMBERSHIP)</b>	<b>TMCN</b>	
<b>SIEGEN</b>		101 943 <b>Climate Alliance</b> (1995)
<b>GÜTERSLOH</b>		100 664 <b>Climate Alliance</b> (1995)
<b>WITTEN</b>		95 876
<b>(NO MEMBERSHIP)</b>	<b>TMCN</b>	
<b>ISERLOHN</b>		91 815 <b>Climate Alliance</b> (1999)/ <b>Covenant of Mayors</b> (Adhesion 2009)
<b>DÜREN</b>		91 272
<b>(NO MEMBERSHIP)</b>	<b>TMCN</b>	
<b>RATINGEN</b>		86 899 <b>Climate Alliance</b> (1993)
<b>LÜNEN</b>		85 838
<b>(NO MEMBERSHIP)</b>	<b>TMCN</b>	
<b>MARL</b>		84 312 <b>Climate Alliance</b> (2000)
<b>MINDEN</b>		81 592
<b>VELBERT</b>		81 564

<b>VIERSEN</b>	77 376	
<b>RHEINE</b>	76 123	Climate Alliance (1995)/ Covenant of Mayors (Adhesion 2008)
<b>GLADBECK</b>	75 518	Climate Alliance (1995)
<b>TROISDORF</b>	74 994	
<b>DORSTEN</b>	74 515	Climate Alliance (1997)
<b>DETMOLD</b>	74 097	Climate Alliance (1997) ICLEI (2022)
<b>ARNSBERG</b>	73 487	Covenant of Mayors (Adhesion 2014)
<b>CASTROP-RAUXEL</b>	73 126	Climate Alliance (1995)
<b>LÜDENSCHIED</b>	71 911	Climate Alliance (2007)
<b>BOCHOLT</b>	71 061	Climate Alliance (2013)
<b>LIPPSTADT</b>	67 793	
<b>DINSLAKEN</b>	67 338	Climate Alliance (2009)
<b>HERFORD</b>	66 495	District of Herford (250.783 pop.) Climate Alliance (2020)
<b>KERPEN</b>	65 802	Climate Alliance (2000)
<b>DORMAGEN</b>	64 500	Climate Alliance (1995)/ Covenant of Mayors (Adhesion 2010)
<b>GREVENBROICH</b>	63 941	Climate Alliance (1996)
<b>HERTEN</b>	61 860	Climate Alliance (1998)/ Covenant of Mayors (Adhesion 2010)
<b>BERGHEIM</b>	61 749	Climate Alliance (2009)
<b>WESEL</b>	60 329	
<b>HÜRTH</b>	59 525	
<b>LANGENFELD (RHEINLAND)</b>	59 112	Climate Alliance (1995)
<b>UNNA</b>	58 816	
<b>EUSKIRCHEN</b>	58 466	
<b>MEERBUSCH</b>	56 479	Climate Alliance (2010)
<b>STOLBERG</b>	56 377	
<b>ESCHWEILER</b>	56 172	Climate Alliance (2016)



<b>SANKT AUGUSTIN</b>	55 590	Climate Alliance (2016)
<b>HILDEN</b>	55 274	Climate Alliance (1994)
<b>PULHEIM</b>	54 636	
<b>HATTINGEN</b>	54 278	Climate Alliance (2000)
<b>BAD SALZUFLEN</b>	54 166	Climate Alliance (2008)
<b>AHLEN</b>	52 635	Climate Alliance (2021)
<b>MENDEN (SAUERLAND)</b>	52 452	Climate Alliance (1994)
<b>KLEVE</b>	52 359	Climate Alliance (2022)
<b>FRECHEN</b>	51 947	
<b>IBBENBÜREN</b>	51 526	
<b>GUMMERSBACH</b>	50 978	
<b>WILLICH</b>	50 283	Climate Alliance (2012)/ Covenant of Mayors (Adhesion 2010)
<b>ERFTSTADT</b>	50 060	Climate Alliance (1995)
<b>BERGKAMEN</b>	48 919	
<b>RHEDA- WIEDENBRÜCK</b>	48 672	
<b>GRONAU</b>	48 576	Climate Alliance (1995)
<b>BAD OEYNHAUSEN</b>	48 535	Climate Alliance (1993)
<b>BORNHEIM</b>	48 348	Climate Alliance (1997)
<b>HENNEF</b>	47 544	
<b>ALSDORF</b>	47 330	
<b>SOEST</b>	47 206	
<b>DÜLMEN</b>	46 706	
<b>HERZOGENRATH</b>	46 225	Climate Alliance (2000)
<b>SCHWERTE</b>	46 124	
<b>BÜNDE</b>	45 376	
<b>ERKRATH</b>	43 878	Climate Alliance (1996)
<b>BRÜHL</b>	43 673	Climate Alliance (1996)
<b>KAARST</b>	43 615	

<b>ERKELENZ</b>	43 275	Climate Alliance (2022)
<b>KAMEN</b>	42 875	
<b>BORKEN</b>	42 650	
<b>HEINSBERG</b>	42 476	
<b>NETTETAL</b>	42 438	
<b>SIEGBURG</b>	41 669	
<b>MONHEIM AM RHEIN</b>	41 279	Climate Alliance (1999)
<b>KÖNIGSWINTER</b>	41 122	
<b>LEMGO</b>	40 456	
<b>HÜCKELHOVEN</b>	40 425	
<b>LÖHNE</b>	39 871	Climate Alliance (2001)
<b>AHAUS</b>	39 404	Climate Alliance (1996)
<b>METTMANN</b>	38 749	District of Mettmann (485.002 pop.); Climate Alliance (1997)
<b>NIEDERKASSEL</b>	38 512	
<b>WÜRSELEN</b>	38 496	
<b>HALTERN AM SEE</b>	37 845	
<b>GREVEN</b>	37 709	
<b>KAMP-LINTFORT</b>	37 635	
<b>WARENDORF</b>	37 173	
<b>WESSELING</b>	36 731	Climate Alliance (2020)
<b>BECKUM</b>	36 637	Climate Alliance (2017) ICLEI (1992)
<b>COESFELD</b>	36 182	
<b>EMSDETTEN</b>	36 068	Climate Alliance (1996)
<b>VOERDE</b>	36 047	
<b>PORTA WESTFALICA</b>	35 734	
<b>LAGE</b>	34 885	Climate Alliance (2019)
<b>DATTELN</b>	34 714	Climate Alliance (1995)
<b>WERMELSKIRCHEN</b>	34 597	
<b>KEMPEN</b>	34 537	

<b>GOCH</b>	34 531	
<b>STEINFURT</b>	34 431	District of Steinfurt (448.585 pop.); <b>Climate Alliance</b> (2008)
<b>HEMER</b>	33 863	<b>Climate Alliance</b> (2006)
<b>GELDERN</b>	33 760	<b>Climate Alliance</b> (2016)
<b>KORSCHENBROICH</b>	33 484	<b>Climate Alliance</b> (1993)
<b>JÜLICH</b>	32 336	<b>Climate Alliance</b> (1995)
<b>DELBRÜCK</b>	32 039	<b>Climate Alliance</b> (2019)
<b>OER-ERKENSCHWICK</b>	31 532	<b>Climate Alliance</b> (2001)
<b>KREUZTAL</b>	30 965	
<b>RHEINBERG</b>	30 933	<b>Climate Alliance</b> (2008)/ <b>Covenant of Mayors</b> (Adhesion 2009)
<b>EMMERICH AM RHEIN</b>	30 869	
<b>GEVELSBERG</b>	30 733	
<b>WERL</b>	30 702	
<b>LOHMAR</b>	30 316	<b>Climate Alliance</b> (2013)
<b>HAAN</b>	30 263	<b>Climate Alliance</b> (2021) <b>ICLEI</b> (2021)
<b>ENNEPETAL</b>	30 117	
<b>MESCHEDE</b>	29 696	
<b>WERNE</b>	29 588	
<b>WALTROP</b>	29 472	<b>Climate Alliance</b> (1993)
<b>RIETBERG</b>	29 432	<b>Climate Alliance</b> (2014)
<b>TÖNISFORST</b>	29 249	
<b>OELDE</b>	29 133	
<b>RÖSRATH</b>	28 759	
<b>SCHWELM</b>	28 590	
<b>HÖXTER</b>	28 509	
<b>WEGBERG</b>	28 130	
<b>MECHERNICH</b>	27 986	
<b>KEVELAER</b>	27 955	

<b>LEICHLINGEN</b>	27 885	Climate Alliance (1993)
<b>SUNDERN (SAUERLAND)</b>	27 554	Climate Alliance (1994)
<b>NEUKIRCHEN-VLUYN</b>	27 532	
<b>GEILENKIRCHEN</b>	27 518	
<b>BAESWEILER</b>	27 319	
<b>WETTER</b>	27 269	
<b>OVERATH</b>	27 124	
<b>HAMMINKELN</b>	26 962	
<b>RHEINBACH</b>	26 949	
<b>SCHLOSS HOLTE- STUKENBROCK</b>	26 943	
<b>HEILIGENHAUS</b>	26 301	Climate Alliance (2022)
<b>SELM</b>	25 802	Climate Alliance (1995)
<b>BAD HONNEF</b>	25 759	
<b>LÜBBECKE</b>	25 573	
<b>VERL</b>	25 382	
<b>HARSEWINKEL</b>	25 338	Climate Alliance (2020)
<b>BRILON</b>	25 336	
<b>WIEHL</b>	25 199	Climate Alliance (1999)
<b>LENNESTADT</b>	25 140	
<b>PETERSHAGEN</b>	25 045	

Source: (Statistisches Bundesamt, 2021)/ Network Membership Data

## Appendix B. Overview of the Conducted Interviews

Interview	Respondents	Date	Length
Interview Neuss	Two co-working city officials with expertise regarding Neuss' municipal climate governance	15.06.22	00:34:30
Interview Bonn	City official with expertise regarding Bonn's international exchange regarding climate governance and sustainability	27.06.22	00:50:11
Interview Paderborn	City official with expertise regarding Paderborn's climate governance	05.07.22	00:48:36

## Appendix C. Interview Guidelines

Since this thesis investigates the local climate governance of German cities, the respective experts were interviewed in German. Conducting the interviews in the experts' mother tongues is anticipated to reduce possible misunderstandings and increase the quality of the results. Accordingly, the original German interview guidelines are presented. The interview questions were customized to the cities according to their respective TMCN membership constellations. A generalized guideline is presented for the cities displaying TMCN membership. A slightly deviating guideline was used to explore municipal climate governance in Paderborn, not displaying TMCN membership. It is thus presented separately. Nonetheless, the interviews cover questions referring to the same components.

### Generalized Interview Guideline for Interviews with experts from cities displaying TMCN membership (Bonn and Neuss)

#### *[Exchange Component]*

1. In welchem Maß findet ein regelmäßiger Austausch ihrer Stadt mit dem/ den Netzwerkinfrastruktur(en) statt, in dem/denen Sie Mitglied sind? In welcher Form besteht Austausch mit anderen Mitgliedstädten?
2. Nehmen Vertreter\*innen Ihrer Stadt an Konferenzen, Vernetzungstreffen oder Workshops teil, welche von dem/den Netzwerk(en) organisiert/initiiert werden?
3. Haben Vertreter\*innen Ihrer Stadt bisher Netzwerk-Angebote wie etwa Trainings- oder Konsultationsmöglichkeiten/Lehrgänge wahrgenommen?

#### *[Content Component: Information sources and incentives for concrete local climate action/ climate policy]*

4. Nutzt Ihre Stadt bestehende Netzwerkforen zur Beschaffung/zum Austausch von Informationen/ Expertise?
5. Dienen bestehende Austauschprozesse mit dem Netzwerk/ den Netzwerken oder mit anderen Mitgliedsstädten als Quelle der Inspiration/Orientierung für konkrete Handlungsanreize oder -initiativen auf lokaler Ebene?
  - a. Finden inhaltliche Komponenten - zB in Netzwerk-Veröffentlichungen erarbeitete „Best-Practices“ - Eingang in die lokale Klimapolitik?
6. Sehen Sie einen konkreten Zusammenhang zwischen bestehenden Austauschmechanismen/Netzwerkeinflüssen und der Implementation neuer Klima-Policies oder dem Ergreifen neuer klimarelevanter Initiativen/ dem Institutionalisieren von Verpflichtungen?
7. Erhöht ein Netzwerkbezug Ihrer Meinung nach die Legitimität für lokales, klimapolitisches Handeln?
8. Welche anderen Quellen für konkrete Handlungsanreize/-initiativen können Sie alternativ beobachten?

*[Ressource Component: Funding]*

9. Von welchen finanziellen Förderprogrammen oder externen Ressourcen profitiert Ihre Stadt zur Gestaltung lokaler Klimapolitik? Welche Förderquellen schätzen Sie als besonders relevant ein?
  - a. Hat die Stadt bisher von Beratungsmöglichkeiten des Netzwerks/ der Netzwerke profitiert, um finanzielle Fördermittel zu beantragen?
10. Hat die Stadt bisher mit anderen Netzwerkmitgliedsstädten kooperieren können, um im Kollektiv klima-/ umweltbezogenen Förderungen zu beantragen/ zu erhalten?

Interview Guideline for Interview with the expert from Paderborn, not displaying TMCN membership

*[Exchange component]*

1. Welche Austauschpartner\*innen/ Foren schätzen Sie für die Ihre lokale Klimapolitik als besonders relevant ein? Bestehen offizielle/ inoffizielle Netzwerke, mit denen Sie einen regelmäßigen Austausch pflegen?
2. Welche Austauschebenen schätzen Sie als besonders relevant ein? Findet vermehrt Austausch mit Akteuren im lokalen/ regionalen Kontext statt oder auch im überregionalen Kontext (z.B. auf NRW-, Bundes-, internationaler Ebene)?
3. Nehmen Vertreter\*innen der Stadt Paderborn an städtischen Konferenzen, Vernetzungstreffen oder Austauschtreffen im Policy Bereich Klimaschutz teil?

*[Content Component: Information sources and incentives for concrete local climate action/ climate policy]*

4. Welche Beziehungen/ Foren nutzt Ihre Stadt zur Beschaffung/zum Austausch von Informationen/ Expertise zur Gestaltung städtischer Klimapolitik?
5. Dienen bestehende Austauschprozesse als Quelle der Inspiration/Orientierung für konkrete Handlungsanreize/-initiativen für städtisches, klimapolitisches Handeln?
  - a. Finden inhaltliche Komponenten (zB Empfehlungen von Expertengruppen) Eingang in die Paderborner Klimapolitik?
6. Sehen Sie einen konkreten Zusammenhang zwischen identifizierbaren Einfluss-/ Austauschmechanismen und der Implementation neuer Klima-Policies oder dem Ergreifen neuer klimarelevanter Initiativen/ dem Institutionalisieren von Verpflichtungen?

*[Ressource Component]*

7. Von welchen finanziellen Förderprogrammen oder externen Ressourcen profitiert Ihre Stadt zur Gestaltung lokaler Klimapolitik? Welche Förderquellen schätzen Sie als besonders relevant ein?
8. Hat die Stadt bisher schon mal mit anderen Kommunen kooperieren können, um im Kollektiv klima-/ umweltbezogenen Förderungen zu beantragen/ zu erhalten?

**Appendix D. Interview Transcripts**

The conducted expert interviews were transcribed in their original language, German, for the purpose of transparency. Any references made in this thesis are paraphrased in English or display own translations of concrete statements. The Appendix containing the corresponding transcripts is submitted in a separate zip file which can be found in the *Data Appendix File*.