

# **The Power in Working Together**

Exploring how Small and Medium-sized Municipalities are  
Collaborating for Ambitious Climate Action

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## **Abstract**

Reaching the 1.5°C target of the Paris Agreement not only requires ambitious goals from national governments, but also the active participation of local municipalities. It is in cities where climate actions need to be implemented to reduce greenhouse gas emissions and reach the international and national climate goals. While the importance of cities and their participation in networks has been well researched, studies have systematically neglected the committed individual agents in small and medium-sized cities and overlooked the importance of national networks. To address these research gaps, this thesis firstly investigates the key factors influencing climate policy implementation in small and medium-sized Danish municipalities. Secondly, it looks at how local climate managers use their municipality's membership in national networks to increase this action implementation. To gather empirical data, twelve semi-structured interviews with seven municipal representatives and five representatives of two national city networks, and four informal discussions were held. Documents were also collected and analyzed. Through comparative content analysis, it was found that the main functions derived from network participation are direct exchanges between the climate managers, mobilization of others in the municipality, accounting of greenhouse gas emissions, and project support. These functions helped overcome key limitations the actors faced within the municipality related to a lack of legal competences, administrative resources and internal support for climate work and financial resources. This has implications for city networks which have been focusing on larger cities and not including smaller cities who have less capacity and would benefit most from the functions provided by them. Key recommendations are that small and medium-sized municipalities should join municipal networks since they have a high potential to gain from them to overcome inherent barriers associated with lower capacity. Moreover, municipal networks should tune their offerings to fit the diverse needs of their members and to not only focus on large and already ambitious cities but also smaller ones and newcomers. Lastly, future research should be done on national adaptation networks to compare with the findings from this thesis. To conclude, this thesis shows how small and medium-sized municipalities can take on ambitious climate plans and actions through collaborations and truly using the power in working together.

**Keywords:** climate action implementation; city networks; small and medium-sized municipalities.

## Executive summary

Cities offer an important area where climate actions can have major contributions for reducing greenhouse gas emissions since it is where people live, work, and consume goods and services. Despite this important role, many local governments face substantial challenges in making climate action plans and even more so when it comes to putting these actions into practice. They commonly face barriers such as a lack of financial resources, a narrow legal scope for actions and low political clout. While most cities have to grapple with these barriers, they are more often felt by those with less capacity. Indeed, many studies have shown the significant influence municipal size has on the climate actions undertaken since larger cities often have more capacity in terms of resources, influence on national governments, and a wider range of sectors to act in. A potential solution to mitigate these challenges has been the voluntary coordination and collaboration between cities through city networks.

However, these networks, especially those operating internationally, are dominated by large high-capacity cities. Current research on urban climate governance has been skewed to emphasize the role of frontrunner cities and larger cities' potential for climate action and on transnational municipal networks (TMNs) and treating cities as internally homogenous actors. This has led to studies systematically neglecting three important areas: **i) small and medium-sized towns (SMSTs); ii) national networks; and iii) the focus of agency at the municipal level.** It remains unclear if the trends found in larger cities are also found in smaller ones. Although this thesis acknowledges the importance of the former, it also wants to stress the importance of increased focus and research on the latter. First, almost 60% of the EU's population lives in towns and suburbs and rural areas. Second, small and medium-sized towns are more constrained in financial resources, staff, and organizational capacities. Third, these municipalities are faced with fewer problems related to agglomeration such as traffic, social segregation, property prices and environmental problems compared to large cities.

Thus, this thesis **aims** to answer the three research gaps identified. By doing so, the overarching purpose of the thesis is to increase understanding of how local actors use national municipal network membership to increase the implementation of their municipality's climate policies. Therefore, this thesis explores a main research question and two **sub-research questions**.

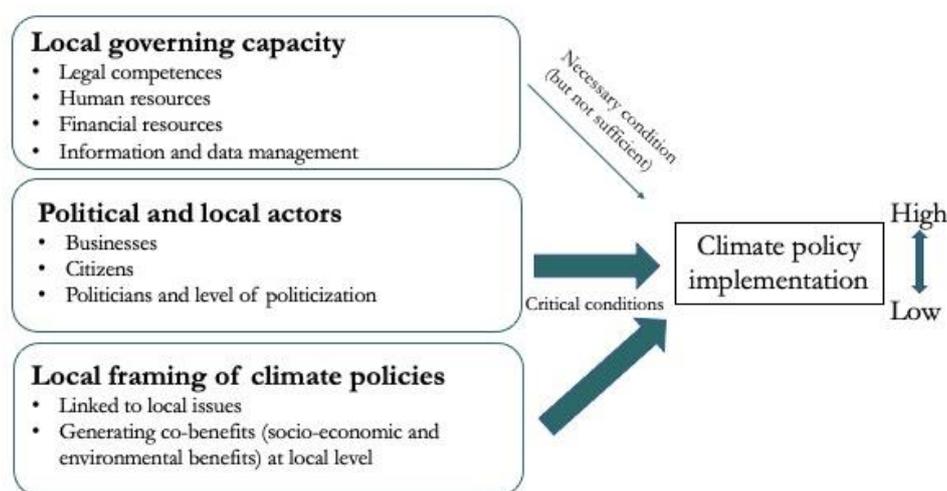
- RQ1: How are small and medium-sized municipalities using national city networks to increase the implementation of local climate change policies?
  - SQ1: What are the key factors affecting the implementation of climate change policies in small and medium-sized municipalities?
  - SQ2: What are the main functions of national city networks used by agents in small and medium-sized municipalities?

To answer these research questions, a **case study research design** was conducted. Two main case study networks were focused on, Energibyerne and DK2020, with seven embedded units of analysis. Data was collected through two main data sources: document review and 12 semi-structured interviews were conducted with seven representatives from small and medium-sized Danish municipalities and five representatives from the two national networks. Comparative analysis was used as the main analytical technique. Data was analyzed on two levels: on the local climate actions at the municipal level and on the network level.

For the first level of **analysis**, the analytical framework developed by Ryan (2015) was used to analyze three key factors affecting climate policy implementation: local governing capacity, political actors and factors, and local framing (see Figure 0-1). Results regarding **SQ1** revealed that the municipalities face some limitations in their governing capacity, mostly in terms of lack

of legal competences and administrative resources. While these are necessary factors, they are not sufficient to lead to climate policy implementation. Indeed, the most important factor was the presence or absence of political will and policy entrepreneurs. Climate managers, acting as policy entrepreneurs, could sway politicians with framing the problem with what the politicians cared most about and linking the climate agenda to other key policies. The most common framing used by the municipalities was the green growth of the municipality where growth by attracting businesses and creating jobs was coupled with lower emission activities. Since many of the municipalities were rural, they have utilized their geographical potential related to renewable energy production. To overcome a lack of power over significant emission sectors, many of the municipalities collaborated with local actors like citizens and local businesses to enable them to take climate actions. In sum, a lack of governing capacity could be overcome by the local framing of climate policies and collaborating with willing political actors.

Figure 0-1. Analytical framework of key factors affecting climate policy implementation



Source: Adapted from Ryan (2015)

Furthermore, to answer the **SQ2** as to how climate managers use networks to overcome local barriers is analyzed by means of the framework developed by Busch et al. (2018) (see Figure 0-2). It focuses on the impact of municipal network membership on the local climate governance. By focusing on the use of networks by the individual agents participating in them, it allowed a more representative overview of the perceived benefits. Indeed, results showed that the four most important functions were the direct exchange between climate managers, internal mobilization of municipal employees on the climate agenda, GHG accounting and project support. Direct exchange was the most important for both networks while the networks offered different benefits. In this way, Energibyerne provided direct exchanges, project support through project collaborations, while DK2020 offered more functions related to internal mobilization, GHG accounting, formulating emission reduction goals and institutionalizing climate trajectories.

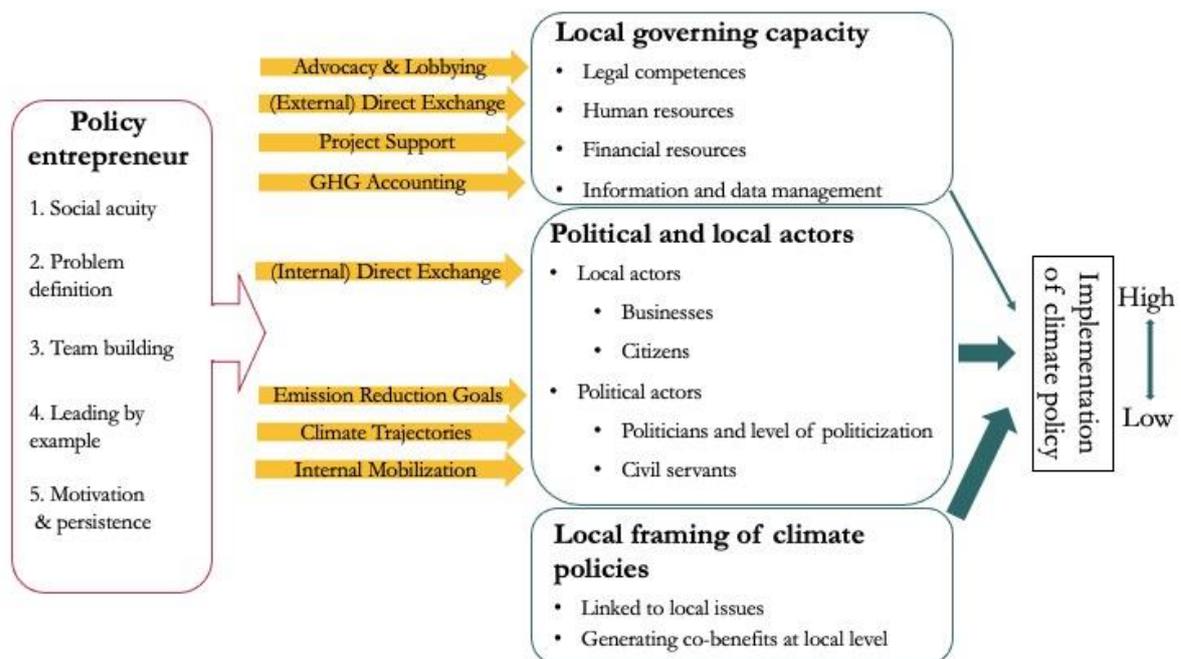
Figure 0-2. Functions of city network membership on local climate governance



Source: adopted from Busch (2016)

For **RQ1**, the main finding is that it is not small and medium-sized municipalities that use membership in city networks but the individuals working on climate policies in the municipalities (i.e., the climate managers) who are acting as policy entrepreneurs. To overcome local barriers on climate action, these actors use networks as a form of governance. The results of this thesis uncovered the crucial role policy entrepreneurs play in linking local climate governance and horizontal governance (see Figure 0-3). The climate managers showed this link by demonstrating the presence of the elements of social acuity, problem definition, team building, leading by example, and motivation and persistence associated with policy entrepreneurs. Agency was an aspect that had not previously received significant attention in the literature on city networks and by using agency through policy entrepreneur theory, this thesis makes an important contribution to the existing literature.

Figure 0-3. Impact of city networks on local climate governance



Source: Own elaboration

Several **recommendations were made to both the municipalities and the city networks.** For the municipalities, it was recommended to locally frame the climate policies in order to mobilize political and local actors who are crucial for the implementation of these policies. Another way that was suggested to have this internal mobilization of actors is by joining city networks since there are significant benefits for them to participate in. To show, it can help to mobilize important actors, institutionalize climate trajectories to anchor the climate agenda within the organization, and it offers the possibility to exchange with other municipal climate managers who may be facing similar challenges. If it is decided to join city networks, there are certain conditions to getting the most out of these networks. The most important condition is to carefully choose who will be representing the municipality within the network activities. This is important since it is these actors that will be using the networks to increase the implementation of the climate policies. This requires the person(s) to have good networking skills and a good network and that they are highly motivated to utilize the functions being offered by the networks.

As for the recommendations to the networks, the general recommendation is to first understand how to best answer the needs and local struggles of the climate managers. In other words, the best way for networks to create value and steer members is to understand what they are currently lacking. Moreover, recommendations are given to enhance the impact of the most important functions from SQ2. For enhancing direct exchanges, networks can offer services that allow such interactions such as field visits and recurring interactions between a small group of people. For the function of internal mobilization, it is recommended to understand why other networks have failed to engage certain municipalities and what would be needed to mobilize politicians to adhere to the network requirements. Regarding GHG accounting, it is recommended to implement benchmarking between the municipalities to promote local climate policy. For project support, the recommendation was to help municipalities with the application process for funding and to coordinate joint project implementation between actors undertaking similar actors to create synergies between them.

**To conclude**, some valuable learnings can be drawn from the results both from the local climate governance and from horizontal governance that could be transferred to other countries, even though the results are context specific. Overall, this thesis showed how small and medium-sized municipalities can take on ambitious climate plans and actions through collaborations and truly using the power in working together.

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## Abbreviations

100RC: 100 Resilient Cities
C40: C40 Climate Leadership Group
CAP: Climate action plan
CAPF: Climate Action Planning Framework
CCP: Cities for Climate Protection
DK2020: DK2020 – Climate plans for all of Denmark
ICLEI: Local Governments for Sustainability (ICLEI)
IIIEE: International Institute for Industrial Environmental Economics
GHG: Greenhouse gas
MLG: Multilevel governance
Mt: megatonnes
Rep: Representative
RQ: Research question
SCC: 'Smart City and Community'
SEC: SmartEnCity
SEC/N: SmartEnCity Network
SMSTs: Small and medium-sized cities
SQ: Sub-research question
TMN: Transnational Municipal Network



# 1 Introduction

Around 75% of global natural resources are consumed in cities, which account for 70% of global greenhouse gas (GHG) emissions, while cities only cover 5% of the globe (UN-Habitat, 2010; United Nations, 2016). As a result, non-state actions taken by local governments, businesses, and civil society organizations are crucial in the global fight against climate change (Bulkeley, 2021). The 2015 Paris Agreement highlighted the role of cities as an essential means to bridging the existing gap between global ambitions to reach the 1.5°C temperature reduction goal and the existing commitments of nation states (Bulkeley, 2021; Davidson et al., 2019). Cities have understood their important function as early as the 1980s when they voluntarily started to engage in climate activities to combat rising levels of GHG emissions. Nowadays, urban action is increasingly mainstreamed and a fifth of the world's population lives in cities taking action on climate change (Galvanizing the Groundswell of Climate Actions, 2019).

Nevertheless, national goals to curb GHG emissions are not systematically broken down to the local level (Fuhr et al., 2018). The voluntary nature of early commitments results in large variations in the target, scope, and quality of cities' climate action plans (CAPs). For example, in Denmark *“emissions mapped by local governments by 2010 amount to 39.9 megatonnes (Mt), whereas the total Danish emissions reported to the UNFCCC was 62.7 Mt, leaving 22.8 Mt, or approximately one third of the national emissions unaccounted for”* (Damsø et al., 2016, p. 80). Additionally, cities face a number of barriers in implementing their planned actions due to a lack of technical knowledge, available funds, and national guidance (Anguelovski & Carmin, 2011; Salon et al., 2014). Coordinated and collaborative action among cities has been proposed as a solution to overcome these barriers. From an early stage, this was understood by some pioneering cities who came together in founding city networks like Local Governments for Sustainability (ICLEI) and the Climate Alliance as a means of sharing knowledge and exchanging best practices to empower and legitimize other cities to engage in climate initiatives (Bulkeley, 2021; Kern, 2019). Thirty years later, these networks cannot go unnoticed as there are more than a hundred formalized city networks representing over one third of the entire global population (Acuto et al., 2017).

## 1.1 Problem definition

A multitude of researchers has emphasized the importance of both cities as actors and prime sites for climate governance along with the significance of the city networks within the larger umbrella term of urban climate governance (Bansard et al., 2017; Hoppe et al., 2016). Bansard et al. (2017) explains that research on urban climate governance generally falls into three categories: i) studies focusing on municipalities or regions as the unit of analysis (i.e., local climate governance); ii) studies focusing on transnational municipal networks (TMNs) as the unit of analysis (i.e., horizontal climate governance); and iii) studies linking municipal climate policy with TMNs as a distinct form of governance (i.e., network governance).

Despite the fact that urban climate governance has been well researched, most academics have focused on the two first categories by using case studies of large cities and global city networks like C40 Cities Climate Leadership Group (C40) and Cities for Climate Protection (CCP) as their units of analysis (Kern, 2019). By solely focusing on these aspects, research has systematically overlooked and neglected three important areas: i) small and medium-sized towns (SMSTs); ii) national networks; and iii) the focus on agency at the network level. Each of these three aspects will now be reviewed.

**Firstly, there is a neglected focus on SMSTs in studies of local climate governance.** Climate actions are crucial not only from large cities but also from SMSTs if GHG emissions are to be reduced. Despite this, SMSTs have been understudied in the two following areas:

research focusing on municipalities for climate actions and the linking municipal climate policy with TMNs as a distinct form of governance.

While this thesis acknowledges the importance of large cities, it wants to emphasize the importance of small and medium-sized municipalities. Studies have demonstrated that municipal size has a significant influence on the level of climate action undertaken because large-sized cities are better equipped in terms of capacities and have more resources at their disposal to combat climate change (Hoppe & Coenen, 2011). This puts them in a better organizational position to adopt sustainability policies (Boehnke et al., 2019; Heidrich et al., 2016). The UN-Habitat (2010) highlighted that megacities and large metropolises receive more funding, research attention, and governmental support at the expense of SMSTs. This difference in research attention was also highlighted by Van der Heijden (2019) who concluded that the current knowledge base is skewed due to an *“over-representation of a handful of large and highly active cities in the Global North and an over-representation of ‘success’ cases at the expense of ordinary or even failing examples”* (p. 11). Despite the importance, many authors focus solely on large cities that have often acted as climate leaders (e.g., Burch, 2010a, 2010b; Krause, 2011; Lubell et al., 2009). Therefore, it remains unclear whether the trends found in large cities are also applicable to smaller ones (Homsy & Warner, 2015; Van der Heijden, 2019). Notwithstanding the growing interest in SMSTs by some authors (see Bausch & Koziol, 2020; Boehnke et al., 2019; Hoppe et al., 2016; Wurzel et al., 2019), they still remain in the shadows.

This trend has also been reflected in city network membership. Indeed, even if smaller cities and towns have far lower capacities than internationally known leaders (Kern, 2019), TMNs are mostly composed of larger cities (Hoppe et al., 2016). Reckien et al. (2015) demonstrated that large and prosperous cities are disproportionately represented in centers of climate planning and that they engage much more in climate networks and thus are able to harness their services to a greater extent. When analyzing city networks within a particular national context, researchers have had the tendency to establish population thresholds to only focus on the biggest ones. To emphasize, this is seen in studies establishing thresholds like having a city population of at least 100,000 in the US for ICLEI membership analysis (Sharp et al., 2011), city network members with a minimum of 50,000 inhabitants in Germany (Busch et al., 2018), and focus on the five largest cities in Sweden (Mejia-Dugand et al., 2016). If smaller municipalities are being included, the importance of their size on the results is not being recognized or explored (Campos et al., 2017). Even when researchers include smaller cities, such as Växjö (Sweden), Samsø (Denmark), or Güssing (Austria) these are characterized as ‘unlikely pioneers’ (Homsy, 2018) since climate leaders are more often found in large metropolitan regions (Kern, 2019). An important statement by Campos et al. (2017) was brought up: *“If being a member [in transnational networks] is a result of being a richer and a more progressive municipality, it seems important to reach out to smaller municipalities, who may be less able to finance local studies, and can benefit from the shared knowledge, experiences, lessons learned, and funding, which is provided through these networks.”* (p. 76).

**Secondly, there is a neglected focus on national networks in horizontal climate governance** (Fuhr et al., 2018; Kern, 2019). Even if national-based networks are the most predominate form of city networks, representing 49% of them (Acuto & Rayner, 2016), most studies are skewed towards global city networks like C40 and CPP (Bansard et al., 2017). This creates a gap between reality and academia since it leaves national climate associations between cities under-researched (Fuhr et al., 2018; Kern, 2019; Reckien et al., 2015). While very little evidence exists on the link between municipal climate policy with city networks as a form of governance, the current empirical studies have focused on quantitative methods and on TMN participation only (R. Krause, 2011; Lee, 2013; Lee & Koski, 2014). National networks are important to research since they offer more opportunities for collaboration between municipalities due to being closer geographically, sharing of a common institutional context

regarding the same legal framework and the sharing of a similar culture and language (Lee & Jung, 2018). This is mostly beneficial for smaller cities and towns who typically participate and benefit more from national networks than in TMNs (Boehnke et al., 2019; Hoppe et al., 2016; Kern, 2019).

**Thirdly, there is a lack of focus on agency in the use of municipal networks to improve local climate governance** (Busch, 2015). Focusing on agency involves looking at who is behind certain changes and to focus on the roles and strategies of the individuals or organizations identified (Meijerink & Huitema, 2010). Many authors, especially those with an academic background in international relations or political science, have examined TMNs from a multilevel governance (MLG) perspective. While the framework of MLG remains a valid analytical tool, it has some important omissions regarding the limited attention to the multiple forms of agency and modes of governing in urban climate politics (Bulkeley, 2021). Indeed, cities are often treated as internally homogenous actors with a coherent agenda and thus assigning them with collective agency (i.e., agency of collective entities) (Busch, 2016; Busch et al., 2018). By doing so, the actions of individual actors and the internal dynamics with a municipality are not being accounted for.

To summarize, climate action implementation in SMSTs by climate managers and their participation in city networks has consistently been underdiscussed and underrepresented in practice and in academia. Smaller municipalities are just as important as larger municipalities to reach international and national goals, especially considering that nearly 60% of the EU's population lives in SMSTs (EuroStat, 2020). For example, only 30% of the Danish population lives in municipalities with more than 100,000 people, which represents only five out of 98 Danish municipalities (Social og indenrigsministeriet, 2020). Therefore, it is crucial to understand the role of smaller cities and municipalities in urban climate governance in order to build a knowledge base, which can help in also getting SMSTs on board the climate journey and to reach the 1.5°C target of the Paris Agreement (Hoppe et al., 2016; Kern, 2019).

## 1.2 Aim and research questions

By addressing the three research gaps identified above, the overarching purpose of the thesis is to increase one's understanding of how local actors use national municipal network membership to increase the implementation of their municipality's climate policies. To do so, emphasis is placed on the city administration and the main actors leading the climate agenda (i.e., climate managers), rather than on the networks.

Thereby, this thesis expects to provide a valuable contribution to both research and practice. By analyzing the perceived benefits municipalities have from network participation, it can help practitioners organize networks in a way that maximizes their value for their members. It can also help civil servants see how they can use network membership as a means of promoting the climate agenda's implementation. Furthermore, this thesis intends to contribute to the literature on national climate networks for SMSTs by focusing on agency, which has all been underrepresented in academia.

To achieve this overarching thesis aim, the following overarching research question (RQ) will be investigated:

- RQ1: How are small and medium-sized municipalities using national city networks to increase the implementation of local climate change policies?

In order to formulate an answer to this question and to achieve the outlined research aim, the following two main sub-research questions (SQ) will be addressed:

- SQ1: What are the key factors affecting the implementation of climate change policies in small and medium-sized municipalities?
- SQ2: What are the main functions of national city networks used by agents in small and medium-sized municipalities?

### 1.3 Scope and Delimitations

This thesis's scope is delineated to allow for sufficient depth of the topic while taking into account time and resource constraints. As such, a case study design was used and it focuses on the individual agents (i.e., climate managers) in seven SMSTs based in Denmark as the unit of analysis and their participation in two national city networks as the two case studies (DK2020 and Energibyerne). Denmark was chosen as the focus because it is a frontrunner in local climate planning and can be considered among the most progressive countries on climate change mitigation and adaptation (Damsø et al., 2016). Therefore, studying Danish municipalities provides a portrait of the direction local climate action may take place in other countries in the coming years. Also, for the first time, climate change was being treated as a top political issue during Denmark's 2019 national elections (Timperley, 2020). This was caused by a high mobilization of citizens demanding governmental action, a massive heatwave during the previous summer, and international attention to the issue.

This thesis will focus solely on **municipalities** and no other forms of subnational governments (provincial, state, or regional) since they have different incentives and constraints affecting their local climate policies and have, especially in a Danish context, greater power to take action. However, since the term 'municipality' could mean different things within different national contexts, its use in this thesis will be clarified. Municipalities are generally viewed as "*territorial divisions with specific administrative functions and legal responsibilities.*" (Fenton et al., 2014, p. 6). In Denmark, 'municipalities' is the common legal term for the 98 local self-governing units regardless of their size and location. Furthermore, they are the closest level of governance to citizens and are considered local authorities (European Committee of the Regions, n.d.). Thus, the terms of local government, municipality, and local authority will be used interchangeably throughout this paper. Additionally, the term 'municipality' will denote the local government as the legal decision-making representative whereas reference to the term 'city' is understood in its broader sense as it is used in literature to refer to 'city networks' and 'small and medium-sized cities.'

More specifically, this thesis will focus on **small and medium-sized towns (SMSTs)**. Defining the size of municipalities is a difficult task since it differs considerably per country and also per continent. Even when limiting it to a European context, which is characterized by a "*high number of small cities and town distributed in a polycentric fashion*" (EuroStat, 2016, p. 9), there are still considerable differences in size and spatial distributions of urban developments in EU Member States. Past literature has used the national classification of the studied country (Dannevig et al., 2012; Fenton et al., 2014). For Danish focused studies, different size classifications have been used (Petersen, 2018; Strobel & Hoff, 2013; Wejs, 2014). For studies conducted in other European countries, they have defined SMSTs in different ways (e.g., small and medium-sized cities, and small and medium-sized local authorities) with different sizes. See Appendix I – City Size Classification for an overview of the different classifications used within academia and in official classifications. For this thesis's purposes, the new global method for classifying and comparing cities, urban areas and rural areas developed by United Nations Statistical Commission will be used. EuroStat, the Statistical Office of the European Union, adopted these degrees for its member states. In Denmark, there is a rather even distribution of degrees of urbanization between its 98 municipalities: 18 municipalities are considered cities, 34 are considered as towns and suburbs, and 46 municipalities belong to rural areas (EuroStat, 2020). However, they are less representative of the EU averages where cities take on the bigger

proportion (41.7%) while towns and suburbs, and rural areas represent 31% and 27.3% respectively (EuroStat, 2020). Aligned with the EU project called TOWN which defined the administrative units that did not fit in the ‘cities’ category as being SMSTs which includes the two classes of towns and semi-dense areas and rural areas of the DEGURBA method (Servillo et al., 2014). Thus, in this thesis, small and medium-sized municipalities represent this definition of SMSTs. More information on this classification is also provided in Appendix I – City Size Classification.

## 1.4 Ethical considerations

This research has been conducted in collaboration with the SmartEnCity network. The thesis topic, scope, and aims, have been discussed with the external supervisor from the SmartEnCity network. Additionally, exchanges on the progression of the thesis took place on a regular basis. For transparency reasons, this collaboration is explicitly stated in this paper and was also mentioned to interviewees. Before the interviews took place, a consent form was sent and signed by the research participants. This form included the research’s purpose and procedures along with the participants’ rights. A statement explaining that participation is voluntary and can be withdrawn at any time and consent for the audio and video recording was also included (Blaikie & Priest, 2019). Participants were given the option to be anonymous and collected empirical data was safely stored on a password-protected computer.

## 1.5 Audience

This thesis produces insights on SMSTs’s climate actions and their use of climate networks. Thereby, it is expected to provide a valuable contribution to both research and practice by answering research questions that advance theory and address a relevant problem. This research is **theoretically novel** since it tests two analytical frameworks that have been developed based on larger cities and based on TMNs. The novelty lies in applying them to SMSTs and to two national networks of different sizes. In this way, it will also test the transferability of the two frameworks. Additionally, research on understanding the actions of SMSTs would make a significant contribution to the literature on municipalities.

Before starting this thesis, the researcher discussed with practitioners the research problems or practical gaps that needed to be filled. This was to ensure that the research provided **practical contributions**. By investigating a city network’s perceived value and functions for municipalities in advancing their climate agenda, this thesis provides practical guidance for how other city collaborations can structure their interactions in a meaningful way.

## 1.6 Outline

This thesis is organized in the following way. In **Chapter 1**, the author presents the research topic by defining the research problem addressed in this thesis, the overarching aims and guiding research questions, the intended audience, and a delineated scope. **Chapter 2** provides a literature review of climate action in municipalities and on city networks in general. This then leads to the analytical and theoretical frameworks that will be used to analyze the results. **Chapter 3** outlines the research design including justifications for a case study approach, the chosen methods for both data collection and data analysis. **Chapter 4** introduces background information on the Danish context, the two networks that are analyzed and the seven municipalities that are part of those networks. Subsequently, in **Chapter 5** these are analyzed using the theoretical frameworks: first, on a municipal level, second, on a network level and third, from the perspective of policy entrepreneurs. **Chapter 6** discusses the results regarding the significance and relevance of the results for both research and practice, and the implications of these findings. **Chapter 7** concludes the thesis by answering the research questions and outlines potential avenues for future research to be undertaken.

## 2 Literature review

In this Chapter, the current academic knowledge on the main topics of this research, being the climate action taken at the municipal and city network level, will be presented in the following sections. Section 2.1 starts with an introduction to the broader field of urban climate governance and the focus of this thesis. Section 2.2 gives an overview of the literature on municipal climate planning and action implementation. Then, city networks will be defined, and the various forms of networks will be presented, followed by an overview of the benefits and limitations of networks, while finishing off with the various functions of networks (Section 2.3). Lastly, the two analytical frameworks used in this thesis to analyze municipal climate actions and city networks will be presented along with the theoretical framework of policy entrepreneurship for the linking between those two levels (Section 2.4).

### 2.1 Multilevel governance

Numerous researchers have emphasized the importance of cities and municipalities in urban climate governance (Bulkeley & Betsill, 2013; Bulkeley & Castán Broto, 2013; Gustavsson et al., 2009; Hoppe et al., 2016). Governance is the wider term used for the different actors participating in climate actions which includes not only local governments but also private actors, citizens, and non-profit organizations. Urban climate governance refers to “*the ways in which public, private and civil society actors and institutions articulate climate goals, exercise influence and authority, and manage urban climate planning and implementation processes.*” (Anguelovski & Carmin, 2011, p. 169). MLG literature emphasizes that actions taken in cities to address climate change must be placed within a larger system to include the influences of other levels of governance. In this regard, cities can deploy actions in climate governance in three main ways. The first is through local climate governance which refers to “*the mitigation and adaptation actions that [municipalities] implement to address climate, environment, or sustainability issues within their own jurisdictions.*” (Gerritsen, 2016, p. 26). The second is in vertical governance which implies that cities as local authorities can establish linkages with higher governing bodies such as with the regional, national, European and international levels (Gerritsen, 2016). Lastly, cities can engage in climate governance by collaborating with other cities and this type of action is referred to as horizontal climate governance (Gerritsen, 2016). These cities collaborations can take place within the same national context or transnationally, meaning across different countries. There are three types of horizontal governance within the EU: i) bilateral networking between two cities (i.e., city twinning); ii) project networking of a limited number of cities by forming city project networks; iii) national and multilateral networking of cities by forming (trans)national city networks (Kern, 2014). Project networking facilitates tailor-made forms of knowledge transfer and learning (Kern, 2019). These networks are said to be more volatile and may disappear at the end of the project (Kern, 2014). Thus, it is said to contrast with the two other types because it takes place over a shorter period of time (Kern & Mol, 2013). These projects are often funded by the EU and by being involved in these projects, cities are able to interact with other cities and form networks (Gerritsen, 2016). Against this background, this thesis is placed within the current debate on cities and focuses on the broader governance of climate change and more specifically on two ways in which cities engage in climate governance: local climate governance and horizontal governance. Within horizontal governance, focus is on networking between more than two cities which includes project network and national networking which will be referred to as city networks (also interchangeably with municipal networks).

### 2.2 Local climate governance

As this governance level is closest to the people, municipal governments are in a good position to develop mitigation and adaptation policies and take climate actions which have a direct influence on their cities and citizens. Climate actions taken on a local basis are defined as “*the*

*measures and initiatives cities take to reduce the severity of climate change (mitigation), or their exposure to the effects of climate change (adaptation)*” (Smeds & Acuto, 2018, p. 557). Climate adaptation relates to preparing for the actual or expected impacts of climate change and climate mitigation is to prevent climate change by reducing sources of GHG emissions or enhance the sinks of GHGs (UNFCCC, n.a.). There are different steps to understanding climate change action. Typically, a city would iteratively go through four different phases: i) understand local climate change priorities; ii) prioritize, select, and climate action planning; iii) implement climate action; and iv) monitor and evaluate impact (C40 network, 2015, p. 33; Moser & Ekstrom, 2010). This thesis focuses more specifically on the planning and implementation phase. A CAP is a “*planning document prepared at the city level that contains policies that are relevant to climate change adaptation and/or mitigation*” (Reckien et al., 2018, pp. 208–209). Implementation is defined as the “*actions taken governmental actors to carry out a public policy decision*” (Ryan, 2015, p. 520) and it involves the stepwise process of “*translating the goals and commitments of a public policy into concrete and operating actions*” (Ryan, 2015, p. 520). Since plan implementation does not entail an explicit causal attribution to impacts, it will be used interchangeably with climate actions in this thesis.

Before a city can plan and implement climate actions, it has to understand their climate priorities and be motivated to engage in climate actions. Many authors have attempted to address the reasons why cities engage in climate action. Based on a literature review, Sippel and Jensen (2009) have unpacked these into four overarching categories: i) economic (cost savings, increase revenues, and fuel green jobs/local green economy); political (external pressure, internal stakeholder pressure, being a frontrunner/leader, attractive city, and symbolic political statements); iii) improve quality of life (air quality improvements, traffic reductions, civic engagement, and community building); iv) informational/psychological (perceived risk or vulnerabilities, and climate-related disasters). Many of these motivators are characterized as co-benefits, i.e., “*local benefits of GHG mitigation that help meet other objectives whose importance has already been established*” (Krause, 2011, p. 197). In the opposite case, Bai (2007) identified three reasons why local governments do not engage due to the scale of climate change: ‘not my turf’ (beyond their municipal boundaries), ‘not in my term’ (long-term problem vs. short term political term), ‘not my business’ (not their task to address global environmental problems).

## 2.2.1 Climate action planning

Developing a CAP is seen as an important first step for local authorities to mitigate GHG emissions and adapt to the changing climate. Reckien et al.’s (2015) analysis of 885 urban areas in the EU revealed that three aspects can influence the development of local climate plans: national legislation, international networks, and city size. Firstly, cities in four countries with national climate legislation (i.e., Denmark, France, Slovakia, and the United Kingdom) were twice as likely to produce local mitigation plans and five times more likely to develop local adaptation plans compared to countries without this type of legislation (Reckien et al., 2018). Indeed, the majority of Danish municipalities have a CAP (CONCITO, 2020), but the national goals to curb GHG emissions have not been systematically broken down to the local level (Fuhr et al., 2018). Thus, the climate governance at the national level influences the development and implementation of CAPs at lower administrative levels (Heidrich et al., 2016; Reckien et al., 2018). Secondly, when national guidance is lacking, cities tend to align themselves to international climate networks. In fact, Heidrich et al. (2016) provided evidence that in the absence of national leadership, cities are more likely to be active members in climate change networks. These help raise awareness, build capacity, and provide expertise and funding through the EU projects to develop a CAP (Reckien et al., 2018). Finally, the importance of size was shown through the fact that 80% of cities with more than 500,000 inhabitants had a comprehensive stand-alone mitigation and/or adaptation plan. Their results showed that the chances of having a mitigation plan increased by 6% for every 10,000 inhabitants and by 1% for adaptation plans (Reckien et al., 2015). In a later study, the lack of resources, inadequate capacity

in terms of preparedness, low levels of competences, and political salience were ranked as the principal barriers for urban centers to local climate planning across EU countries (Reckien et al., 2018). Indeed, cities can deliver strategies without wider support and guidance from the national government but to do so they need to have capacity, resources, and political will. Research has shown that in countries without national guidance, only larger or capital cities have adopted a CAP, which creates a considerable gap between smaller and larger cities (Heidrich et al., 2016; Reckien et al., 2015).

Three components have been identified as critical for successful climate change incorporation in CAPs: awareness, analysis, and action, the latter “*being the plans’ weakest points across the board*” (Krause, 2011, p. 197). Oftentimes plans lack the incorporation of specific actions they will undertake to reach the goals they set themselves. Even if planning and setting targets are important, establishing a direct link between these CAPs and subsequent climate actions leading to reduced emissions has been hard (Damsø et al., 2016; Millard-Ball, 2013; Reckien et al., 2018). Thus, setting targets is one thing and achieving them is another. In many cases, the targets set at the global, national, regional levels are being put into practice at the local level (Karhinen et al., 2021). This is exactly why local climate action is so important.

## 2.2.2 Climate action implementation

When it comes to the implementation phase of the CAPs, it is important to recognize that “*understanding the specific elements of a challenge that hinder a city from delivering action is crucial to shape the solutions required to overcome them*” (C40 network, 2015, p. 30). Betsill and Bulkeley (2003) listed five local conditions they consider necessary to trigger substantial local climate action: (i) presence of a committed individual in local government (ii) with a solid CAP, (iii) that has sufficient funding available, (iv) has power over related domains and (v) the political will to act. Ever since this landmark publication in 2003, numerous studies, both conceptual and empirical, have been done on the factors influencing local climate policy and action in cities and developed their typology of barriers. Some of these barriers were presented in different ways such as their occurrence in during the policy process (Burch, 2010b; Moser & Ekstrom, 2010), while others present the barriers specifically for climate mitigation (M. M. Betsill, 2001; Burch, 2010b; Krog & Sperling, 2019; Mosannenzadeh et al., 2017), for climate adaptation (Adger et al., 2007; Jensen et al., 2016; Pasquini et al., 2013) or both (Reckien et al., 2015). While formulated differently, the various barriers are often similar in literature related more generally to factors linked to institutional/regulatory/legal system, social and cultural context, resources, political and the physical/environmental context. Within the context of this paper, ‘*influencing factors*’ can either be a barrier or an enabler for a government to take climate action, depending on the context. One of the repeated influencing factors was the capacity of local governments to take climate action. Whether in the global North or South, in developed or developing countries, cities are commonly faced with a lack of political support, financial and human resources and other forms of capacity for both climate mitigation and adaptation (Anguelovski & Carmin, 2011). Indeed, the implementation of climate measures is the most expensive part of mitigation and adaptation (Bausch & Koziol, 2020). From his literature review of all articles from 2008 to 2018 on urban climate governance, Van der Heijden (2019) found the following factors to have been identified as enabling cities to govern local climate action effectively: a supportive political and legal context; autonomy for taking climate actions and higher decision-making power; access to funding for climate action; vertical coordination; horizontal coordination; and being part of capacity-building and learning networks.

For the case of Denmark, the different barriers, especially the institutional ones, have been investigated by several researchers already (Hedensted Lund, 2018; Jensen et al., 2016; Krog, 2019; Krog & Sperling, 2019; Lund et al., 2012; Petersen, 2018; Wejs, 2014). However, all these studies have strictly focused on looking at climate planning or climate action from an

institutional perspective. For example, Jensen et al. (2016), when analyzing the institutional barriers in Danish municipalities for climate adaptation in local governance, found that the size of municipality had a significant influence on the capacity for climate adaptation actions. This was also found for Danish studies focusing on climate mitigation (Damsø et al., 2016; Strobel & Hoff, 2013).

A key characteristic that seems to correlate with the capacity for climate action is the size of the municipality. From a capacity and resource point of view, it is argued that larger municipalities have more resources and diversified capacities, thus making them better equipped to combat climate change and have more political-institutional capacities (Amundsen et al., 2010; Kern et al., 2004). Pioneering cities in climate change policy such as London, Stockholm, Barcelona, and Munich are more globalized and globally networked than small towns in rural areas (Kern & Mol, 2013). On the contrary, SMSTs have less political clout, power, and influence on higher levels of government than larger cities, especially those with an international reputation (C40 network, 2020). The majority of small and medium-sized cities have yet to develop appropriate mitigation and adaptation strategies (Kern, 2019). SMSTs have different problems than large cities and have different potentials to act as solution areas. Smaller cities and towns have a higher proportion of emissions coming from agriculture practices, and transport. They also have a higher potential for producing renewable energy and not only consuming it. Therefore, it remains unclear if the trends identified for larger cities are also applicable to smaller ones (Homsy & Warner, 2015; Van der Heijden, 2019), and if best practices and experiences from larger cities can be replicated to smaller cities and towns (Kern, 2019).

Based on this review, it can be argued that the resource factors related to governing capacity are necessary for climate action and that if any of the factors is significantly lacking, local governments are likely to be unable to implement their CAPs (Ryan, 2015). While government capacity is necessary, it is not sufficient for a policy to be implemented since even when it exists, the execution of climate policy can be delayed or stopped by actors in the policy process. A well-known criticism of institutional theory is its emphasis on how agency is constrained and shaped by institutional structures (Wejs, 2014). Thus, to analyze municipal action in a holistic way, a broader view that also includes an agency-focused analysis is a necessary complement (Ryan, 2015). For example, the presence or absence of a local champion or a committed individual agent has been identified as a key factor for both climate planning and for climate implementation (Bedsworth & Hanak, 2013; M. M. Betsill, 2001; R. Krause, 2011; Salon et al., 2014; Wejs, 2014). These actors can use municipal networks or engaging with local stakeholders to bypass a lack of capacity.

## 2.3 Municipal climate networks

A well-researched area in urban climate governance is studies focusing on TMNs as their unit of analysis (M. Betsill & Bulkeley, 2007; Kern & Bulkeley, 2009; Lee & van de Meene, 2012). Several definitions of municipal networks have been elaborated over the last couple of years. For this study, *municipal climate networks* are “*networks of local governments that voluntarily come together to improve climate governance*” (Busch et al., 2018, p. 222). In this thesis, these networks have the following characteristics: i) members can acquire formal membership; ii) a network is more than a bilateral network, hence they have more than two members; iii) it is more than a single project-based partnership; and iv) it focuses on climate issues.

### 2.3.1 Forms

City networks appear in various forms and have different characteristics, depending on their goals. Acuto and Rayner (2016) have illustrated a preliminary landscape of city networks and

their role in contemporary world politics. The typologies to describe city networks of Acuto and Rayner (2016) and Keiner and Kim (2007) have been combined to form the list below:

- *Geographical scope*: international (TMNs), regional, national, or subnational
- *Topical coverage*: sectoral/thematic issues (environment, energy, policy issues, urban issues, social issues, cultural issues) or holistic (sustainability, mitigation, and/or adaptation)
- *Members/membership*: number of members, membership requirements/fees, member privileges/benefits, voluntary or mandatory participation, constituency (business/private sector, city/local government, NGOs, individuals)
- *Governance body*: founding/leading organization (European union, research institutes, other sponsors, partner networks), governance structure (one-tiered, two-tiered or pluralized), governance model (public, private, hybrid)
- *Type of outputs and tools*: reports, joint pilots and policies, information exchange, events (conferences, workshops, seminars).

While they are quite diverse in these characteristics, municipal networks are said to follow the similar goals of exchanging information, knowledge, and best practices; increasing cities' capacity; and voicing cities' concerns at higher levels of government (Bouteligier, 2012). Even though municipal networks only started back in the 1990s, their nature has evolved greatly since then. Authors often distinguish between two types of networks: the older generation of TMNs, with characteristics like public actor engagement, inclusiveness, and self-governing (e.g., ICLEI, Climate Alliance) (1990s-2000s), and the new generation of TMNs, that are characterized by the influence of private actors, exclusiveness, and employment of enforcement mechanisms to reach network goals (e.g., C40, 100 Resilient Cities (100 RC)) (Nielsen & Papin, 2020). This difference has an influence on the characteristics listed above. The aspects of geographical scope, members/membership, and governance body will be explained more in the following paragraphs, since the other two are more self-explanatory.

### **Geographical scope**

The distinction of city networks by their levels of governance scale is commonly used in literature (Busch, 2015; Gustavsson et al., 2009; Haupt & Coppola, 2019; Heikkinen et al., 2020; Kern & Bulkeley, 2009; Nielsen & Papin, 2020; Woodruff, 2018). Within academic literature, TMNs have been the most commonly focus within global governance studies. While some authors use the term TMNs as an all-encompassing category for different levels (Bansard et al., 2017; M. Betsill & Bulkeley, 2007), this thesis uses it to refer exclusively to those operating internationally (Busch, 2016). To add, SMSTs are often more connected to intermunicipal regional networks (Hoppe et al., 2016), while larger-sized cities are more active in TMNs (Boehnke et al., 2019). This is explained by the institutional, economic, or staff resources required to join the network that makes membership more difficult for smaller cities. If smaller cities participate in TMNs, they often act as 'passive' or 'dormant' members since they have membership but don't participate once they are part of the network (Fenton & Busch, 2016).

Climate networks operating at the national level involve the collaboration of a number of regions from the same country. This form can occur between different lower levels of subnational governments (city, county, metropolitan area, provincial). The nature and functions of city networks are constantly evolving according to the changing perceptions of sustainability and the role of cities (M. Betsill & Bulkeley, 2007). Indeed, new forms of networking are arising at the national and subnational levels. Kern (2019) identified three types of territorial networking. The first was networking initiated by local authorities (e.g., 'Klimatkommunerna' in Sweden (climate municipalities in Swedish) and national associations representing all municipalities, the second was networking initiated by regional authorities and the third

networking initiated by actors at national and EU levels (e.g., National Clubs of Covenant of Mayor signatories). These have only been briefly mentioned by the author, but empirical analysis is still lacking. The reason for distinguishing between city networks at international and national levels is because they differ in structure, membership fees or requirements, services offered, functions, and also in the benefits and limitations attached to them (Woodruff, 2018), explained later in Section 2.3.2.

### **Members/membership**

As the name indicates, municipal networks are first and foremost networks of municipalities (Haupt et al., 2020). Nevertheless, these municipalities could differ in terms of size, capacities, or financial means (Haupt et al., 2020; Kern, 2019) depending on the type of municipality the network is targeting in their goals. For example, a network could be an all-inclusive mass networks with more heterogenous members (e.g., Covenant of Mayors, Energy Cities), while other exclusive elite networks with more homogenous members (e.g., C40, 100RC) (Haupt & Coppola, 2019). As previously explained, SMSTs are often more connected to intermunicipal subnational networks (Hoppe et al., 2016), while larger-sized cities are more active in TMNs (Boehnke et al., 2019). This is explained by the institutional, economic or staff resources required to join the network that makes membership more difficult for smaller cities. If smaller cities participate in TMNs, they often act as ‘passive’ or ‘dormant’ members since they have acquired membership but don’t participate once they are part of the network (Fenton & Busch, 2016).

### **Governing body**

The governance body/network leadership of a city network can be composed of an administrative body and an advisory board or board of directors and their task is to support, mediate, and structure the communication between members to create strong ties between them (Keiner & Kim, 2007). According to Bouteliger (2012) literature on TMN can be categorized either as studies that see cities as spaces or those that see them as actors. Within the first characterization, TMNs are seen as spaces where cities from two or more countries join to exchange on diverse issues (Bulkeley et al., 2003). It also reflects the more traditional governance model of city networks which are governed by public authorities. As TMNs have evolved, other models have emerged. Indeed, Bulkeley and Newell (2015) claimed there are three main governance models of environmental TMNs: public (highly decentralized, public networks consisting of municipalities), hybrid (mix of public and private actors), and private governance (TMN are composed of corporations, NGOs, foundations governing the program).

Depending on the form of governing body, networks can try to steer their members’ behavior. Steering mechanism involves looking at how networks are trying to influence the behavior of cities once they become members. These steering mechanisms are defined as “*the ways in which TMNs orient the behavior of their members towards network goals.*” (Nielsen & Papin, 2020, p. 6). Kern and Bulkeley (2009) identified three soft governance mechanisms that are often used by networks to steer their members: i) information and communication (by making information on best practices available to their members); ii) project funding and cooperation (by facilitating member cooperation in bids for funds and implementing joint projects); and iii) recognition, benchmarking, and certification (by establishing norms and standards to measure performance and reward exemplary achievements). However, there are also harder governance mechanisms to steer behavior, such as compulsory action, rule-setting, or funding. Bulkeley and Newell (2015) have argued that certain types of actor compositions are associated with certain types of membership conditions and steering mechanisms. For example, if the actors in the network are more private companies, the membership terms are more likely to be exclusive rather than inclusive.

### 2.3.2 Benefits and limitations of networks

There are a variety of benefits cities gain from participating in city networks. For the purpose of this study, these benefits will be distinguished based on their geographical orientation since they incur differences. This is deemed necessary since in some cases, the limitations of one type may be the strength of another. For both the benefits and limitations of city networks, the general elements will be presented and then elements more specific to national networks will be covered.

#### **Benefits**

Municipalities will participate in networks where the potential benefits of participating in the network need to outweigh the transaction costs of different types of interaction (staff time making binding requirements like creating a CAP or pay membership fees) (Bontenbal & van Lindert, 2009; Boogers et al., 2016; R. M. Krause et al., 2021; Mejia-Dugand et al., 2016; Woodruff, 2018). Municipal networks play a key role in both climate action planning (Reckien et al., 2015) and in fostering, supporting, and implementing climate action (Castán Broto, 2017). Indeed, it has been demonstrated that network membership makes a significant positive difference in the amount of climate change policies and actions implemented (Boehnke et al., 2019; Campos et al., 2017). A report by C40 (2015) claimed that municipalities that collaborate with other actors have the ability to deliver twice as many climate actions than those that don't. Networks have these advantages because they create opportunities for members to access resources and capacities they do not have on their own (Glasbergen et al., 2007; Westman & Broto, 2018). In that way, Niederhafner (2013) stated that there are three structural drivers to participating in networks: a lack of knowledge (goal: networking), a lack of influence (goal: lobbying), and a lack of financial means (goal: funding). For the first driver, municipal networks help local governments learn from each other, they offer information and knowledge sharing platforms to empower local initiatives (Haupt et al., 2020), and showcase best practices (Lagendijk et al., 2020). In this way, it lowers transaction costs and avoids cities having to 'reinvent the wheel' (Hoppe et al., 2016). For the second driver, municipal networks are seen as a beneficial way for local governments to bypass and get around the limitations of their national governments by collaborating with cities. For the last driver, networks provide members with resources and support such as tools and guides for them to take action (Woodruff, 2018). Moreover, networks have intangible outcomes (greater trust between participants, forum for raising and discussing other new issues) which are often as important as the tangible ones (setting global standards, gathering and disseminating knowledge) (Keiner & Kim, 2007). In essence, engaging in municipal networks represents a strategy used by cities to manage external dependencies and a lack of resources. As such, from a resource dependence perspective, "*lower capacity cities have a greater need for collaboration*" (R. M. Krause et al., 2021, p. 7).

There are several strengths to national city-to-city cooperation: geographical proximity and sharing of the same language can reduce transaction costs of cooperation; similar cultural (ways of living, communicating and thinking) and institutional (coherent legal and administrative frameworks) contexts can enhance cooperation among domestic networks (Lee & Jung, 2018). Indeed, geographical proximity and shorter distances allow for continuous face-to-face interactions which facilitate the creation of social ties and thus the formation of networks (Boschma, 2005; Coenen et al., 2012). As explained by Boschma (2005), geographical proximity cannot be considered as a sufficient condition for exchanging tacit knowledge and it can be substituted by other forms of proximity such as organizational, institutional proximity. Institutions act as the 'glue' for collective action since they reduce uncertainty and lower transaction costs. Formal institutions like laws and rules, and information institutions like

cultural norms and habits “influence the extent and the way actors or organizations coordinate their actions” and they are “enabling or constraining mechanisms that affect the level of knowledge transfer, interactive learning and (thus) innovation” (Boschma, 2005, p. 68). Moreover, the upscaling of place-based experiments is also most successful if they are connected to national and regional networks which are more important for mid-sized cities and towns (Kern, 2019).

**Limitations**

Nevertheless, there are critical arguments against networking. Firstly, differences in the economic and political contexts can make it difficult to replicate ideas from other cities (Gustavsson et al., 2009). Secondly, cities that are not able to allocate personal or financial resources to participate in meetings and projects are indirectly excluded from these (Gustavsson et al., 2009). This also relates to something touched upon by Fenton and Busch (2016) with the ‘invisible’ or dormant cities who are part of TMNs but act as passive members. This is linked to certain issues of equity in terms of who is able to participate in such initiatives (procedural equity) (Bulkeley & Newell, 2015). Third, already proactive frontrunner cities may draw ahead even more (Gustavsson et al., 2009). Fourth, there may be higher transaction costs with networking with cities in different contexts due to language barriers, resulting in partnerships being slow in bringing the first, concrete results (UNIDO & FCSSC, 2019). Fifth, there is a risk of some cities free riding off networks by taking advantage of their membership for branding but that are not actually taking on climate actions to reduce their emissions. Municipal networks do not have any hierarchical authority over their members nor the capacity to coerce members into adopting certain policies and cannot even harmonize cities’ reduction targets and climate projects (Hakelberg, 2014). This relates to a major challenge associated with city networks in terms of accountability, which was conceptualized by answerability and enforceability (Bulkeley & Newell, 2015). While answerability (i.e., the need to justify and explain positions and actions adopted) can be curbed through mechanisms like audits, disclosure, peer review, and standard setting, city networks have a limited ability to enforce standards (Bulkeley & Newell, 2015). Thus, when a city is not complying with a standard, they do not have the legal authority to impose sanctions, which is normally a common way to overcome free riding (Dolšak & Prakash, 2017). Other means used to overcome this is through peer and community pressure and by providing financial and technical support since some cities may not have the capacity to meet obligations due to budgetary pressures or lack of expertise (Dolšak & Prakash, 2017).

On a national level, there may be differences in terms of the size, socio-economic conditions, and political conditions (different mayoral partisanship) between the cities that could impede the cooperation between cities. Cities in the same country could compete to gain more financial resources and better reputations (Lee & Jung, 2018). Nevertheless, these differences can be overcome by grouping cities by similar types, sizes, socio-economic conditions and focus areas, as argued by Lee and Jung (2018). There needs to be a balance between the similarities and level of proximity since too much and too little proximity are said to both be detrimental to learning and innovation (Boschma, 2005). An overview of the benefits and limitations of municipal networks previously presented is found in Table 2-1.

Table 2-1. Overview of benefits and limitations of municipal networks

	Benefits	Limitations
<b>City networks in general</b>	<ul style="list-style-type: none"> <li>• Positive influence on climate action implementation and number of CAPs</li> <li>• Access to resources and capacity</li> <li>• Information and knowledge sharing</li> </ul>	<ul style="list-style-type: none"> <li>• Differences in political and economic context</li> <li>• Some procedural equity issues</li> <li>• Could be more beneficial for front-runner cities</li> <li>• Cultural and language barriers</li> <li>• Risk of free riding</li> </ul>

	<ul style="list-style-type: none"> <li>• Showcase best practices</li> <li>• Bypass national limitations</li> <li>• Offer consultancy services and tools</li> </ul>	<ul style="list-style-type: none"> <li>• No legal authority over municipalities</li> <li>• Accountability issues</li> </ul>
<b>National city networks</b>	<ul style="list-style-type: none"> <li>• Geographical proximity</li> <li>• Similar culture and language</li> <li>• Same institutional context</li> </ul>	<ul style="list-style-type: none"> <li>• Different sizes, socio-economic conditions and political conditions</li> <li>• Competition for funding and branding</li> </ul>

Source: Own elaboration

### 2.3.3 Functions of city networks

Within literature, there have been different attempts at conceptualizing the impact of TMNs on local climate governance. Within the recent years, three main theoretical frameworks have been presented with similar functions, as seen in Table 2-2. These frameworks all focus on describing the impacts occurring from the interactions between the network and its members and has the city as the unit of analysis. Four main functions are found across the three frameworks: i) horizontal flows of information between cities; ii) functions focusing on the implementation of policies; iii) the rules and the members’ compliance with them and, iv) the influence of networks on higher levels of government through lobbying (Busch et al., 2018). Even though the contact person between the municipalities and the network has a powerful position since they can retain or steer information in a desired direction (Keiner & Kim, 2007), it has not been taken into account in these frameworks.

Table 2-2. Overview of network roles and functions

Functions	Theoretical framework		
	Bulkeley et al. (2003): 4 ways climate governance is affected	Andonova et al. (2009): soft use of governance instruments	Busch (2015): 4 functions of TMN impact on local climate governance
1 (horizontal flow of information)	Knowledge dissemination	Information sharing	Platform for members
2 (implementation and policies)	Implementation of EU policies	Capacity building and implementation	Consultancy
3 (rules and commitment)	Policy initiation	Rule setting	Commitment brokering
4 (lobbying)	Lobbying		Advocacy and lobbying

Source: Adapted from Busch et al. (2018)

In summary, the literature on city networks has mostly focused on TMNs to which larger cities tend to participate more in. When the impacts of city networks are analyzed, it is often done at a city level and does not account for the individual agents representing the municipality in city networks. Moreover, city networks have different forms which influence the associated benefits and limitations it has even though this is not being acknowledged by most authors. There are also different ways to analyze the functions and impacts of city networks, but they are currently all done from a multilevel perspective or focusing on the city level and ignoring the local agents representing the municipality in the network.

## 2.4 Theoretical framework

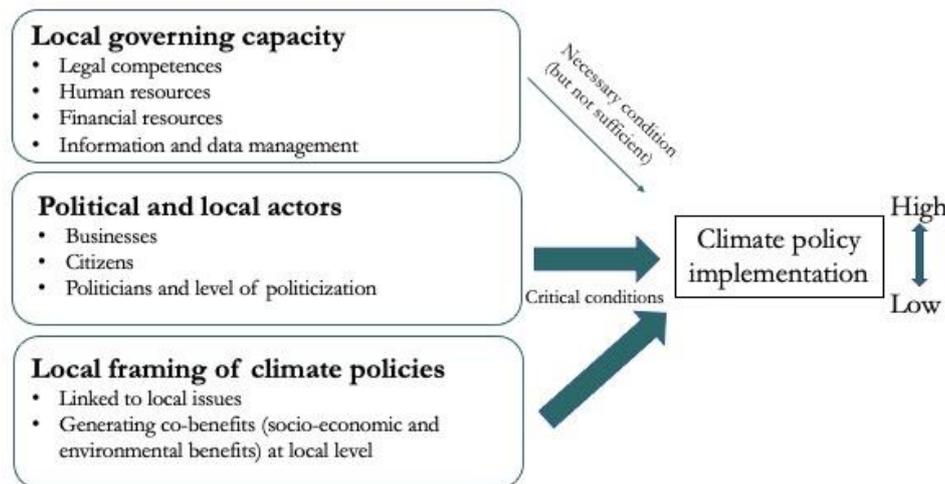
This Section presents the theoretical frameworks of this thesis, which is the lens through which the research questions will be analyzed and interpreted. The two sub-research questions are approached from two theoretical angles. First, a theorization of agency is used to locate the relevant factors that influence climate policy implementation in the municipalities. This will be

combined with an analytical framework which is a hybrid of structure and agency. Second, the most important functions of national city networks for climate managers of SMSTs will be identified through an analytical framework which is done from an agency perspective. Finally, these two analytical frameworks are connected through a theoretical lens on policy entrepreneurs to answer the overarching research question. This will help demonstrate how municipal climate managers use city networks to advance the local climate agenda.

### 2.4.1 Local municipal level

Hoppe et al. (2016) acknowledged the lack of focus on small and medium-sized municipalities and created an analytical framework to systematically analyze local climate policy and action in small and medium-sized cities in the Netherlands. This framework seeks to provide an overview of “factors that in some way or another relate to local climate actions” (Hoppe et al., 2016, p. 3). While it is tuned to the size of municipalities researched in this thesis, it falls, like most literature on climate change and urban issues, into the trap of ‘everything matters’ (Ryan, 2015). This leads to authors producing a long list of factors that could potentially influence the local climate policies. While this gives a rich description, it does not allow for the assessment of causal significance in order to see if it is a necessary or sufficient condition for successful implementation. Thus, as opposed to a linear analysis of causality, Ryan (2015) argues for a configurational approach by analyzing different combinations of conditions. Since the focus of this study is on key factors, using such a framework allowed for a more refined and targeted approach which is why his analytical framework was used. In this framework, there are three sets of key factors affecting the implementation of local climate policy at the local governance level, visualized in Figure 2-1. These factors were identified by the author through a literature review on climate change and urban policy and the analysis of climate policies in the three of the largest Latin America urban areas of Buenos Aires, Sao Paulo, and Mexico D.F.

Figure 2-1. Analytical framework of key factors affecting climate policy implementation



Source: Adapted from Ryan (2015)

The first factor affecting climate policy implementation is the **local governing capacity**, which is understood as the power and resources available for local government to enable municipal climate action. On the one hand, power is the extent to which local governments have authority in key policy sectors related to climate change initiatives such as energy, waste, transport, and planning. On the other hand, resources encompass not only financial means but also human, technical, and informational resources. However, in cases where local governments have the capacity to implement policies, it does not necessarily mean that policies will end up being

implemented. This is why Ryan (2015) argued that government capacity factors can be considered as being necessary, enabling conditions for climate policy implementation but not sufficient to lead to climate action.

The second critical condition is the focus on how **political actors and factors** influence the development of climate policy at the local level. This local community support is seen as important for implementing climate action. This local community includes different actors such as homeowners, local businesses, media, the public, environmentalists, developers, and neighborhood organizations. Moreover, the level of politicization of climate issues at the city level was also considered to be an important element. A low level of politicization means that “*climate change is not an electorally salient issue and is not subject to competition between political parties*” (Ryan & Ramirez Cuesta, 2016, p. 3). In Ryan’s original framework, policy entrepreneurs were considered as a separate actor in the political and local actor factor, but it was initially removed for this thesis’ analysis since it was analyzed in a separate framework.

The third factor relates to local framing. If climate policies are **framed in relation to local problems** and generate other socio-economic or environmental benefits, they are more likely to develop and advance them. Local framing involves “*linking global, long-term climate concerns to issues of local relevance*” (Ryan & Ramirez Cuesta, 2016, p. 2). This involves changing the distribution of costs and benefits of a climate policy and enhances the possibility of building broader and stronger local political and social support for the initiatives (Ryan & Ramirez Cuesta, 2016). Actors like policymakers and politicians can use issue framing as a tool to gain political commitment (Uittenbroek et al., 2014).

The first factor focuses more on the structural factors while the two last factors are based more on an agency-centered analysis. This is because they are focusing on the role of local political and social actors and on factors shaping their interests regarding climate policy. This framework thus combines a structure perspective and an actor/agency perspective.

## 2.4.2 Network level

As a critic of the three frameworks previously presented on the functions of city networks in Section 2.3.3, Busch et al. (2018) pointed out that the frameworks do not include the internal governance process within the member municipalities. To counter, they developed a new framework to analyze “*the use of TMN membership by local actors and an assessment of the importance of these processes*” (Busch, 2016, p. 43). These local actors were identified to be climate managers since “*even if the mayors are the actual signatories to networks [...], the actual interest in and impacts of member cities’ work with networks are defined and shaped by local climate managers*” (Busch, 2016, p. 59). Thus, the authors took the climate managers and their departments as their units of analysis and focused on the agency level and the same is done in this thesis. Climate managers will be broadly defined as the “*staff in municipalities who work on climate mitigation and/or adaptation issues*” (Busch, 2016, p. 49). Their goal was to show solid empirical evidence of the most important functions from the member level based on a survey answered by the climate managers in German municipalities. City network functions are referred to the “*advantages or services cities gain from being a [network] member*” (Busch, 2016, p. 53). A total of 11 functions were identified and five functions were identified to be the most important, which are visualized in Figure 2-2. During the empirical analysis of this thesis, all 11 functions will be used to assess the impact of network membership on local governance.

Figure 2-2. Functions of city network membership on local climate governance



Source: Adapted from Busch (2016)

These five main functions are defined as:

- *Enabling internal mobilization* refers to using TMN membership to motivate climate governance within the member city in order to succeed in “*putting climate change-related issues on the local political agenda, raising awareness among the local population or justifying climate change mitigation or adaptation measures by means of the TMN membership.*” (Busch, 2016, p. 56).
- *Formulating emission reduction goals* by setting benchmarks, making the municipalities committed to the goals politically accountable for reaching them. Thus, sufficient political support is necessary to have this.
- *Institutionalizing climate trajectories* by means of institutionalizing climate governance through formal decisions which were motivated by the membership in the TMN like formal climate strategies or creation of positions in the administration.
- *Enabling direct exchange* between staff from members cities. It encompasses peer learning, direct cooperation between staff members and motivational effects delegates gains from network conferences. This is different from the other functions of the presentation of ‘best practice examples’ or ‘green city branding.’
- *Offering project support/consultancy services* where local governments can access consultancy services through the city network who offers of know-how and tools, management packages for climate-related activities and campaigns, computer programs.

The first three functions refer to local processes that do not require direct interaction with the network, while the two last functions are applicable to the municipality-network interaction. This framework differentiates itself since it reflects how actors at the local level use the city’s membership in networks. It contrasts with the typical analysis on networks which stresses the multilevel character of urban climate governance and focuses on the interaction between different levels (Busch, 2016, p. 70). In other words, this framework looks at the impacts of TMNs as a tool used by local agents (level of analysis: individual agents in cities) as opposed to the impacts on the city from a MLG perspective (level of analysis: local level/city) (Busch, 2016, p. 70).

The six other functions cited less frequently are (Busch et al., 2018):

- *Exchange of best practice* examples promoted by the networks’ information systems like homepages, newsletters, and conference presentation.

- *Helping with GHG accounting* to generate knowledge of local emissions by providing methodologies like a software for GHG accounting. The emission data can be used to identify intervention points for local climate policies. This relates specifically to climate action planning.
- *Referring to a global context* where networks influence local climate policies by providing information on international climate policies.
- *Enabling access to funding* since networks typically do not provide funding themselves, but they provide access to funding by other entities.
- *Advocacy and lobbying* on behalf of their members at higher administrative levels. This can lead to more favorable conditions for the work of climate managers in municipalities and cities through new funding schemes for local projects. Benefits from this function are not directly visible to actors in the city.
- *Enabling green city branding* by offering cities opportunities to advertise their city through several channels like press releases, newsletters, conferences, and a space on homepages to highlight their efforts.

### 2.4.3 Policy entrepreneurship

Based on the literature review on local climate governance and city networks as well as the previously introduced frameworks, the concept of policy entrepreneurs (also referred to as institutional and political entrepreneurs, champions, and change agents) has been brought up several times, highlighting their important role in climate change planning (M. Betsill & Bulkeley, 2007; Busch, 2016; Kern & Bulkeley, 2009; Lee & van de Meene, 2012; Wejs, 2014). While policy entrepreneurs are often said to be necessary actors to implement the climate agenda of networks on the local level (Kern & Bulkeley, 2009; Lee & van de Meene, 2012), it is rarely being analyzed from the policy entrepreneur theory perspective (Busch, 2016). The concept of policy entrepreneur was first introduced by Kingdon (1985) who explained that entrepreneurial actors can be found anywhere, including at the individual, local, and national level as well as in NGOs and businesses. Thus, there are different types of entrepreneurs depending on the sector and roles (e.g., corporate entrepreneurs, social entrepreneurs, and policy entrepreneurs) (Lovell, 2009).

Within policy, entrepreneurs are found in government as politicians or as civil servants and their main activities involve driving policy change and developing new policy ideas (Lovell, 2009). In particular, policy entrepreneurs are actors participating in the policy-making process and they can be identified by their efforts to promote significant policy change (Mintrom & Norman, 2009). They distinguish themselves by “*their desire to significantly change current ways of doing things in their area of interest*” (Mintrom & Norman, 2009, p. 650). They “*share a common willingness to invest their resources (time, reputation, and/or knowledge) in a particular proposal for policy change and possess good networking skills.*” (Meijerink & Huitema, 2010, p. 5). Mintrom and Norman (2009) defined four central elements of successful policy entrepreneurship: social acuity, team building, problem definition, and leading by example. All policy entrepreneurs are said to exhibit these characteristics, but some policy entrepreneurs will be stronger in some of these elements compared to others. Mintrom and Norman (2009) pointed towards a gap in policy entrepreneur theory where “*the motivations of policy entrepreneurs have gained limited attention to date.*” (p. 661). This gap was picked up by Busch (2016) and included as a fifth element in his approach to investigate the use of TMNs by climate managers. Overall, this concept of policy entrepreneurs has rarely been applied in the analysis of the use of TMNs in local processes and only briefly mentioned in literature. The first element is **social acuity** which refers to the ability of policy entrepreneurs to take advantage of ‘windows of opportunity’ to promote policy changes (Mintrom & Norman, 2009). This was also highlighted by Gunn (2017) who said that policy entrepreneurs need to be able to recognize and respond to opportunities and potential triggers. They must display high

levels of social acuity or perceptiveness in their understanding of others and engage in policy conversations (Mintrom & Norman, 2009). They do so in two ways according to Mintrom and Norman (2009). The first is through their good use of policy networks which helps them acquire knowledge from the outside. The second way is “*by understanding the ideas, motives and concerns of others in their local policy context and responding effectively*” (Mintrom & Norman, 2009, p. 652). Thus, actors that are well-connected and get along well with others are more likely to secure policy change.

The second element regards the fact that policy entrepreneurs are team players and their strength does not come from their ideas alone but from their ability to work effectively with others and their **team-building** capabilities (Mintrom & Norman, 2009). They recognize the importance of building teams and engaging with coalitions to promote policy change (Mintrom & Norman, 2009). Mintrom and Norman (2009), along with Meijerink & Huitema (2010) who advanced the explanation of these forms, explained that these team-building activities can take three forms. The first form is when they operate within a tight-knit team composed of individuals with the same or similar ideas beliefs, and values and who offer mutual support in pursuing change (Meijerink & Huitema, 2010). The second form is when policy entrepreneurs make use of their personal and professional networks both inside and outside the jurisdiction in which they are seeking policy change (Mintrom & Norman, 2009). They form a strategic alliance with parties that do not have the same policy beliefs, values but share a common interest in the sort of policy change (Meijerink & Huitema, 2010). The last form is a coalition that do not share beliefs or values nor policy preferences but are dependent on each other for realizing their divergent objectives (Meijerink & Huitema, 2010).

The way **problems are defined** and which attributes are made salient can determine what individuals and groups pay attention to (Mintrom & Norman, 2009). In other words, “*problem definition affects how people relate specific problems to their own interests*” (Mintrom & Norman, 2009, p. 652). In essence, to achieve policy change, close attention has to be given to the way a problem is presented to others. This is closely related to the skill of the construction of narratives around a policy issue (Gunn, 2017). The narrative can interpret a problem in a particular way such as presenting evidence in ways that suggest a crisis at hand (as a problem) or the opportunities that could come from action (solution/added value) (Uittenbroek et al., 2014).

**Leading by example** is another means through which policy entrepreneurs can effectively promote policy changes. The risk aversion of many decision makers is a major challenge for the actors seeking policy change and a common strategy utilized to overcome this barrier is to engage with others to clearly demonstrate the workability and potential implementation of an idea (Mintrom & Norman, 2009). Leading by example involves “*taking an idea and turning it into action themselves*” which signals the genuine commitment of these change agents to improve outcomes (Mintrom & Norman, 2009, p. 653).

The **persistence and motivation** of policy entrepreneurs are last element analyzed. Previous literature has focused on the motivations of entrepreneurs to offer individual level explanation for their actions. Thus, their motivations are explained through a rational actor guided by career prospects and self-interest (Kingdon, 1985). Furthermore, these entrepreneurs demonstrate considerable perseverance by working on certain transitions for a significant part of their career (Meijerink & Huitema, 2010). Persistence was also suggested as an important characteristic of policy entrepreneurs (Kingdon, 1985).

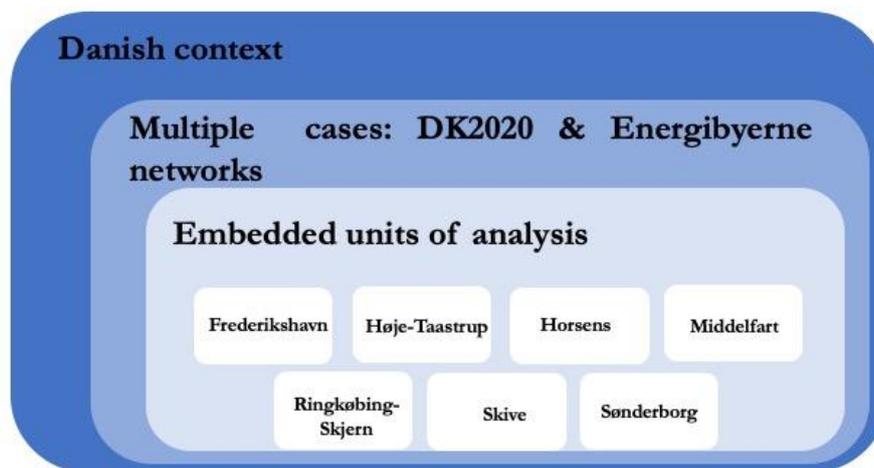
### 3 Research methodology

This Chapter outlines the overall research design and the underlying logic of this thesis. It gives a detailed description of why case study as a research design was chosen (Section 3.1). Then, justifications will be provided on the choices made for data collection regarding interviews and document review (Section 3.2), and data analysis (Section 3.3). Finally, the validity, reliability, and limitations of this thesis’s methodology will be discussed (Section 3.4).

#### 3.1 Research Design

Case study as a research design is “an empirical inquiry that investigates a contemporary phenomenon (the ‘case’) in-depth and within the real-world context, especially when the boundaries between phenomenon and context may not be clearly evident” (Yin, 2014, p. 16). It was deemed an appropriate method for this type of study for a number of reasons. Firstly, a case study design should be considered when the focus of the research is on answering ‘how’ questions (Yin, 2014) and when testing theories (Eisenhardt & Graebner, 2007). Since the overarching research question (RQ1) of this thesis is formulated as a ‘how’ question and that two analytical frameworks are being tested, a case design is relevant for this thesis. Secondly, a distinguishable characteristic of a case study is that it allows the researcher to conduct an in-depth analysis and maximizes the information that can be gathered from the units (Blaikie & Priest, 2019; Flyvbjerg, 2006). This aligns with the aims of this thesis since it desires insights from the perspective of the individuals working on the climate agenda within each of the municipalities. Moreover, case study allows for flexibility in the research design which also the researcher to adapt its structure according to new findings (Perri & Bellamy, 2012). Lastly, case study research is useful when the topic is broad, highly complex, and has an important context (Ebneyamini & Sadeghi Moghadam, 2018), which is the case here within the broader topic of urban climate governance.

Figure 3-1. Embedded single case study on DK2020 and Energibyerne



Source: Adapted from Yin (2014, p. 50)

Yin (2014) explains that there are four different types of designs for case studies which involves choosing to have either a single or multiple case and either have one holistic unit of analysis or have embedded units of analysis (also called subunits of analysis). For this study, the chosen design was an embedded multiple case study, as seen in Figure 3-1 above. This means that multiple (2) cases were chosen with several (7) subunits of analysis. However, this is not considered a ‘typical’ embedded multiple case study where normally each case would have its own embedded units whereas in this study the cases have the same subunits (the seven municipalities). An embedded case study was chosen rather than a holistic case study because

the focus of this research is on two levels of analysis: the municipal and the network levels. In this way, it can capture these two since it allows the researcher to look at units located within a larger case (Baxter & Jack, 2010; Yin, 2003).

Initially, it was chosen to focus on one case study, Energibyerne (single case study with embedded units), since it was judged more advanced in its implementation process compared to DK2020. However, DK2020 was repeatedly brought up by all the interviewees and the benefits it provides. Therefore, the design of this study was changed from a single to a multiple case studies instead, in order to reflect the findings. Furthermore, multiple case studies provide a better understanding of the phenomenon since different benefits will be drawn from the two networks. This is an advantage since the researcher is able to analyze the data within each situation and across different situations and to understand the similarities and differences between the cases (Gustafsson, 2017; Yin, 2014). Compared to single case studies, multiple case studies provide a stronger basis for theory testing, enables comparisons that clarify whether a finding is simply random to one case or is consistently found across cases and yield more robust, generalizable, and testable theories (Eisenhardt & Graebner, 2007).

### **3.2 Data collection**

The research methods used for this thesis are of a qualitative nature. This was chosen because it provides insights into human experiences, it focuses on how complex social worlds are interpreted and experienced and it is based on methods of analysis and explanation that aim to understand the complexity, detail, and context of social worlds (Pawson & DeLyser, 2016, p. 431). Its value lies in allowing respondents to speak for themselves and to move beyond mere description by providing explanations (Pawson & DeLyser, 2016, p. 431). In order to gather different perspectives on the topic, this thesis draws data from two sources of data: documents and interviews. Using multiple data sources, a hallmark of case study research, enhances the credibility and quality of the data and it also adds strength to the findings since various sources of data promotes a greater understanding of the case (Baxter & Jack, 2010; Flyvbjerg, 2006). Data from these different sources is then corroborated in the analysis part rather than analyzed individually where each data source contributes to the researcher's understanding of the whole phenomenon (Baxter & Jack, 2010). To ensure a comprehensive understanding coming from different perspectives, data was collected from interviews with practitioners and documents of various organizations (i.e., public sector, private and non-profit organizations) that are involved in city networks. The data collection and analysis were conducted in two parts: document sources were first gathered and analyzed and then it was followed by interviews. Overall, this means that different sources of information were collected from the document review (secondary and tertiary types of data) and from interviews (primary).

Furthermore, a review of the existing literature was performed before the empirical data was gathered to comprehend the relevant topics of city networks and municipal climate action. Several terms were researched in Google Scholar and the Lund University search engine related to the concepts of city networks and its different forms (e.g., municipality networks, national networks, TMNs, etc.); 'climate action plan'; 'small and medium-sized city'; 'replication'; 'climate action'; 'climate policy implementation.' Consequently, the identified literature was mapped out in a synthesis matrix according to common themes and similar concepts which included parameters such as 'city network level' (including 'TMN'; 'national city network'; 'regional network'); 'local climate action'; and 'barriers to climate action.' Since the topic area is rather novel, the review has concentrated on the most recent research over the past ten years.

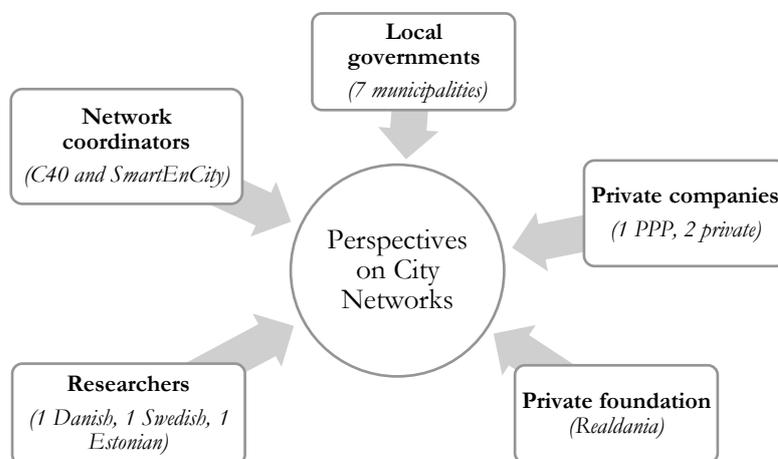
### 3.2.1 Document review

Document review is a systematic procedure for reviewing or evaluating documents (Bowen, 2009). Document review fulfilled three main goals: as a complementary method to the interviews as a means of triangulating, i.e., combined; provide background context on the research participants and lastly, it was an effective way to gather data when events that cannot be observed such as Energibyerne’s network meetings (Bowen, 2009). Documents, specifically reports, plans like CAPs, and websites from the practitioner organization along with news articles on their climate activities, were considered to provide a useful basis to complement the information collected during the interviews. These documents were collected from websites, supplemented by online search engines. Online searches included the name of the municipality and terms like ‘climate action’; ‘climate action plan’; ‘DK2020’; ‘climate’; and ‘energy’. Some of these documents were in Danish only and were translated to English via free online translators. Moreover, secondary information was sought from the Danish statistical website in order to provide a descriptive overview of the units on information such as the type of municipality and population growth. For Energibyerne, information from their webpage, private minutes of meetings from the network (11 meetings) and the public summary of the meetings were gathered from the SmartEnCity website. The various documents that were reviewed can be found in Appendix II – List of practitioner documents.

### 3.2.2 Interviews and discussions

For case study research, interviewing can be particularly beneficial as it allows the researcher to obtain the interpretations of others and discover new perspectives on the topic (Yin, 2003). Interviews are also considered valuable to gather comprehensive data from complex internal processes which might be difficult to access with other methods such as observations or surveys (Eisenhardt & Graebner, 2007). As such, interviews, more specifically semi-structured interviews, are often used and are particularly well suited for case study research (Hancock & Algozzine, 2006). A key approach to limit bias in data collection is to “use numerous and highly knowledgeable informants who view the focal phenomena from diverse perspectives.” (Eisenhardt & Graebner, 2007, p. 28). The selection of interviewees was guided by the defined scope of this thesis in Section 1.3 and the goal of covering the perspective of all the representatives and practitioners in the networks (see Figure 3-2). Additionally, four informal discussions also took place with various researchers and ongoing discussions with the SmartEnCity network coordinator took place over the course of the thesis period.

Figure 3-2. Overview of conducted interviews and informal discussions



Source: Own elaboration

The most important consideration in conducting interviews is to identify the persons who may have the best information with which to address the study's research questions (Hancock & Algozzine, 2006, p. 40). In this case, since the goal of this study was to establish the link between the local level and the network level, the person working full-time on the climate agenda within the municipality and representing their municipality in networks was interviewed, aka the local climate manager. It was only feasible to interview one person per municipality even if for three of them there was more than one of these local agents. This limitation was due to time constraints of this thesis. One person from each of the network actors was also interviewed (e.g., project managers, network leader). In total, 12 interviews were conducted: seven with municipality representatives and five with representatives of networks, along with four informal discussions (see Appendix III – List of interviewees). The municipal representatives from Energibyerne were identified through desk research and recommendations from the SmartEnCity network coordinator. Since some municipalities or private entities had more than one representative (two-three), they were all emailed and given an overview of the purpose of the interview in order for them to decide who was most appropriate and available. Discussions with the network coordinator also took place to verify who would be most valuable to interview. Additional to the municipalities, interviews also took place with the three private entities in Energibyerne (ProjectZero, Tankegang, and PlanEnergi) and two of the three actors (Realdania and C40) that implemented DK2020. This was important since they also participate in the network and have different roles within these.

A semi-structured interview format was used for the interviews. On the one hand, this format allows for comparability and reliability of the results, which is crucial for a comparative case study (Yin, 2014). Considering that the qualitative aspect of interview responses makes the coding inherently more complex, using a semi-structured interview guide facilitates the analysis and comparison (Cope, 2016). On the other hand, it also allows flexibility in the question formulation since additional questions or probing questions can be added (Cope, 2016).

The municipal interviews were structured according to three main thematic topics: i) the climate background of the municipality; ii) concrete climate actions implemented in the municipality; iii) effects of network membership on the climate work in the municipalities. The first two topics focused on municipal climate action and tried to get insights on the key factors affecting the implementation of the climate policy (SQ1), while thematic topic 3 focused on SQ2, regarding the impacts of network participation. For the interviews with the private entities, they were asked about their role within the network, how it came together, and questions on their perception of the collaboration. This gave insights on the actor composition and the membership terms of each network (network level). The interview guide and more description on the thematic topics of the interviews can be found in Appendix IV – Interview guide.

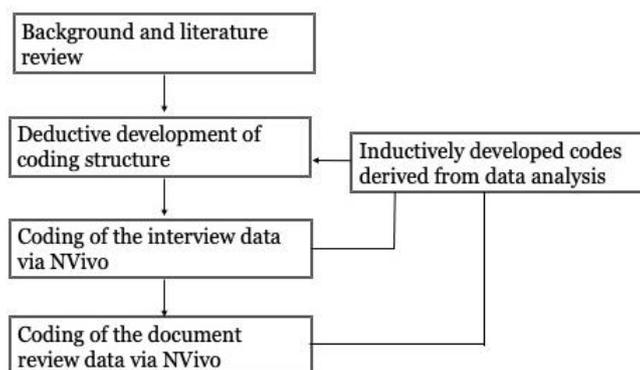
Interviews were conducted online via Zoom in English with an approximate duration of 45 to 60 minutes. All the interviews were video- and audio-recorded in order to retain a full record of the conversation and avoid inaccuracies due to poor recall (Yin, 2014). Computer written notes were also taken during the interviews. After each interview, a memo, i.e., usually a short note to oneself, was written down to capture quick insights, get the 'raw feeling' from the interviewee and reflect on the main takeaways (Cope, 2016). Transcribing the interviews was a time-consuming process where nine interviews were done by hand and five with the assistance of transcription software. Moreover, member checking was used to determine the accuracy of the qualitative findings by sending the results back to the interviewee participants for them to verify their accuracy (Creswell, 2014). They were also asked to review the direct quotes used and their unit description. This allowed to mitigate certain difficulties related to the interviewer and interviewee having different native languages.

### 3.3 Data analysis

A powerful advantage of having multiple case studies with embedded units is that the data can be analyzed in three ways: *within* the units separately, *between* the different units, or *across* all of the units (Baxter & Jack, 2010). This structure will be used to analyze the data in the results section (see Section 5). For the municipal level analysis, data from each municipality was presented separately and then analyzed between the units following the first analytical framework. A similar structure was used for the network analysis but with the second analytical framework. Then, the results are analyzed across all the units when the theory of policy entrepreneur is applied.

To analyze the data between and across, a comparative content analysis was used. A comparative analysis is “*a form of analysis used in case study research that compares similarities and differences across multiple instances of a phenomenon to enhance theoretical/conceptual depth (...) It helps to develop richly detailed conceptual explanations of the phenomena*” (Hay, 2016, pp. 440–441). As explained by Yin (2014), each unit in embedded studies is treated as a separate study and then the resulting data is compared. The technique of comparative analysis is especially relevant when the case study consists of at least two cases and when the main case study is about a broader case with multiple units of analysis as embedded units (Yin, 2014). Accordingly, it will be the analysis technique used for this thesis. Correspondingly, a content analysis involves constructing themes and patterns in data (Dunn, 2016). Coding is the process of organizing data into ‘chunks’ that are alike and a coding structure is the compilation of the emerging codes into meaningful clusters, hierarchies, or categories (Hay, 2016). This process is analytical and requires to review, select, interpret and summarize the information without distorting its meaning (Walliman, 2006). This analysis followed the process visualized in Figure 3-3. The NVivo software was used for the coding to allow for both a systematic and an efficient analysis. Using such a database allows the researcher to document data as a way to maintain a chain of evidence and increases the reliability of the study (Yin, 2014).

Figure 3-3. Process of qualitative content analysis



Source: Own elaboration

The coding structure (see Appendix V – Initial coding structure) for both the municipal level and network level was developed based on the analytical frameworks derived from the literature review (theory-based codes). Subsequently, the transcribed interviews were coded according to the coding structure. Once this was done, the set of documents and gray literature were also analyzed to complement what had been found in the interviews. This systematic coding was done in order to have a focused analysis of the case within the scope of the research questions. Once all documents and interviews went through the first round of coding, a second round was done to see if some codes could be merged, deleted or moved.

### 3.4 Validity, reliability, and limitations

There are certain limitations to the research design and methods employed in this thesis that could hinder the validity and reliability of the results. According to Yin (2014, p. 49), there are four criteria to judge the quality of a research design: construct validity, internal validity, external validity, and reliability. Since internal validity is mainly concerned with explanatory studies (Yin, 2014), it was not considered relevant for this exploratory study. Thus, the three other criteria will be addressed. Firstly, to ensure a high construct validity of the findings, i.e., accuracy of the results, key terms were conceptualized, a draft of the case study report was reviewed by interviewees, and a chain of evidence was kept during the document review.

Secondly, external validity involves “*defining the domain to which the findings of the study can be generalized*” and transferable (Yin, 2014, p. 46). While case study type of research has a number of benefits, one of the most common criticisms of case studies is that one cannot generalize its results (Blaikie & Priest, 2019). However, certain methods of selection have been used to aid the generalizability of the results. The primary strategy utilized in this thesis to ensure external validity was by the provision of ‘thick’ and detailed descriptions of the case study. This was pursued in order to make it easier for another researcher to evaluate if this thesis’s findings are transferable or relatable to their setting and case (Blaikie & Priest, 2019). The second method used was by the “*strategic choice of a case may greatly add to the generalizability of case study*” (Flyvbjerg, 2006, p. 226), which depends on the intended purpose of the research. In this case, the cases were strategically chosen to represent ‘typical cases’ of Danish municipalities by showing that those being studied share similar structural characteristics (Blaikie & Priest, 2019). All of the seven municipalities are small and medium in size with an average population of around 59,560, ranging from 38,853 to 90,966, representing the average population size of a municipality in Denmark (59,415 inhabitants in 2020 (Dijkstra & Poelman, 2014)). They are also representative of four out of the five regions in Denmark since they are spread out across the country.

Lastly, two techniques were employed to ensure the reliability of this study a case study database was used with NVivo for a systematic analysis and structured interviews. The interviews were structured in a similar fashion regarding the introduction and also to what type of stakeholder group they belonged to meaning if they were civil servants from municipalities, private actors, or from private foundations. Moreover, the qualitative aspect of interview responses makes it harder to code and may differ per respondent. There is also a risk that some respondents may have provided socially desirable responses by telling the researcher what they thought they want to hear. These potential biases involved in conducting interviews were mitigated by internal triangulation (verifying for data consistency among respondents) and external triangulation (by seeking to validate interview comments with other sources of evidence such as other peer-reviewed articles and discussions with researchers). Furthermore, a limitation to conducting interviews only with a single representative could limit the reliability of the results since it provides only one perspective on both the local climate governance and network level to answers for the research questions. Extending the data collection to include a document review and conduct interviews with the network representatives is expected to offer a broader database and to compensate, to a certain extent, a potential lack of interviews with more local agents. However, while the document review provided some broader insights, certain elements could have gotten lost in translation, since six of the nine reports used had to be translated. This aspect was also present for some of the interviews where a few of the interviewees had troubles translating certain terms. This was mitigated by letting them say the word or phrase in Danish and verifying the term with a native Danish speaker and this was possible due to the interviews being recorded.

## 4 Background

### 4.1 The Danish context

Denmark is a unitary state with three governance levels: national, regional, and local (European Committee of the Regions, n.d.). Aligned with other Scandinavian welfare states, responsibility for implementing national policy decisions has, to a large extent, been decentralized to local authorities (Kasa et al., 2018). In 2007, based on the principle of subsidiarity, a major reform of the government structure took place, which in turn led to the dissolution of the 14 counties into five regions along with the merger of 271 municipalities into 98. The minimum size for the municipalities was set at 20,000 and those with fewer inhabitants had to merge with others. This had a major influence on the average municipal size since it went from just under 20,000 to approximately 55,000 inhabitants (Indenrigs- og Sundhedsministeriet, 2006). The 2007 reform also modified the division of powers among the different levels of governance by giving more powers to the government level which is closest to the citizens: the municipalities. It therefore reinforced the municipal self-governing powers (Costa & Liouville, 2013). Table 4-1 shows the division of powers between the different authorities, climate-related responsibilities, and their financial autonomy. There are no hierarchical relations between the municipalities and regions since they have different attributions and responsibilities and are governed by different laws (Costa & Liouville, 2013; European Committee of the Regions, n.d.).

Table 4-1. Division of power between the different levels of government

	State	Regions	Municipalities
<b>Power</b>	Legislative power, Executive powers for the environmental sector.	Limited power.	Can only regulate when power specifically delegated to them, High self-governing power.
<b>Climate related authorities</b>	Preparation of nature and water plans, Offshore wind farms, Danish Energy Agency, Data collection on climate as a baseline for climate adaptation strategies, Overall power on agriculture policies.	Establish transport companies, Regional public transport, Monitoring of CO <sub>2</sub> emissions, Collaborating with municipalities to achieve self-sufficiency in renewable energy by 2050, Tourism, nature, and environment, Regional public transport.	Local road network (95% of roads), Spatial planning, Preparation of CAPs, Energy supply through energy companies, Action plans for water management.
<b>Financial autonomy</b>	Can levy taxes.	Cannot levy taxes, No financial resources, financed by the State and municipal contributions.	Can levy taxes (70% of revenues come from taxes on income, property and corporations), State grants.

Source : European Committee of the Regions (n.d.); Costa & Liouville (2013).

The State government has general legislative powers in areas of national sovereignty (e.g., policy, defense, foreign affairs). The five regions depend on the Regional Government Act and are represented as the Danish Regions ('Danske Regioner' in Danish). The 2007 reform limited the regions' powers by assigning the transfer of competences from the counties to the municipalities, along with the transfer of corresponding resources (around 15%) (Costa & Liouville, 2013). Their current responsibilities include health, social services, specialized education, and regional development. They also do not have financial resources of their own since they are not entitled to levy taxes and are financed by the State and municipal contributions (Costa & Liouville, 2013).

The interests of the 98 municipalities are represented in front of the State by the association of 'Local Government Denmark' (LGDK) which has some influence over local government

planning and decision-making process of policies (Costa & Liouville, 2013). The 2007 reform reinforced the municipal self-governing powers by assigning them more responsibilities like spatial planning. However, the municipalities do not have the power to make their own regulations and can only regulate when power has been delegated to them. Each municipality can decide its administrative structure and the organization of the different departments and the allocation of functions between them (Costa & Liouville, 2013). The municipal organization is governed by municipal councils, being led by a mayor (Costa & Liouville, 2013). The municipal council consists of members from the different political parties, who are up for election every four years. From then, the administrative structure breaks down into departments who are responsible for different public policy sectors (e.g., Technical and Environmental department, Health department) which can then be separated into teams. Moreover, Danish municipalities have great freedom with regards to their revenues and financial management of resources (Costa & Liouville, 2013). Municipal financing varies between municipalities depending on the size of their population. Local authority budgets are yearly negotiated between the LGDK and the State. The revenue autonomy (own revenue relative to total resources available) at the sub-national level (regions and municipalities) is slightly lower than EU average (42% vs. 53% in 2018) (European Committee of the Regions, n.d.).

#### **4.1.1 Climate planning and action**

When the current Danish government came into office in 2019, they passed the Danish Climate Law (LBK no.523) which legally requires the country to reduce GHG emissions by 70% by 2030 compared to 1990 and to become a zero-emission society (fossil free) by 2050. It is said to be *“one of the strongest laws of its kind in the world”* (Timperley, 2020). As one of the first actions after this law adoption, the governmental coalition also established thirteen partnerships representing all sectors of Danish businesses who were tasked with elaborating solutions to reduce emissions in their industry (State of Green, 2019). One of the critics towards these partnerships is that they did not create one for the public sector for reducing emissions in municipalities. In contrast, when it comes to municipalities, adopting climate mitigation plans is still a voluntary task. Nonetheless, most municipalities in Denmark consider climate change as a ‘shall do’ task and have CO<sub>2</sub> reduction targets and CAPs (66 out of 98) (CONCITO, 2020). Since they have high self-governing powers, climate change can be integrated in the sectors falling in their purview. Despite this strong motivation, the lack of direction from the national government has led to very few municipalities having a CAP aligned with the goals of the Paris Agreement. There are also significant variations between them in terms of methods, goals, and initiatives (Damsø et al., 2016). Chiefly, energy-related emissions had a high coverage of 72-82% in Danish CAPs, compared to non-energy-related emissions (industrial processes and product use (IPPU); agriculture; land use, land use change and forestry (LULUCF); and waste) that had a low coverage of 42-55% (Damsø et al., 2016). As for climate adaptation, it was made mandatory in 2013 for Danish municipalities to include it into municipal spatial plans (Reckien et al., 2018). However, no governmental body is responsible for coordinating climate adaptation among municipalities which creates an ‘institutional void’ (LIFE, 2015). An apparent major shortcoming hindering the effective implementation of climate adaptation plans relates to the structural reform of 2007 and the privatization of water management in 2009 (Jensen et al., 2016). In practice, this means that climate adaptation is looked at from a wastewater issue to be solved by gray infrastructure like sewer pipes and basins (LIFE, 2015). An overview of all the city networks operating in Denmark can be found in Appendix VI – Overview of municipal networks in Denmark.

## **4.2 The city networks**

In the following Sections, an overview of the two case study networks will be presented, DK2020 in Section 4.2.1 and Energibyerne in Section 4.2.2. Both Sections will present the main

actors involved in setting up the network and the background on how it was initiated. This will help understand the functions of each network has for the seven municipalities which will be discussed in the subsequent Chapter. Both networks could be more considered as ‘project networking’ since they have a limited time frame but they both have the potential and are trying to become more long-term networks. A comparison of the two networks is given in Appendix VII – Table of different characteristics of the networks of Energibyerne and DK2020.

#### 4.2.1 DK2020

C40 is an international city network focusing exclusively on megacities. It is mainly financed by three philanthropic organizations: the Bloomberg Philanthropies, Children’s Investment Fund Foundation, and Realdania. Realdania is a private Danish foundation with the mission to create quality of life through a built environment in Denmark (Realdania, 2020a). By being a strategic funder of C40, it yields them a seat at the board of directors. Thus, their ambition through their C40 partnership is “*that the pool of knowledge on climate action is developed and disseminated in the C40 network should also benefit Danish cities.*” (Realdania, n.d.). In 2016, C40 published their Deadline 2020 to guide cities in how to reduce their emissions in order to reach the Paris Agreement 1.5°C target. A common tool was established by a pilot project of eight mega C40 cities: the ‘Climate Action Planning Framework’ (CAPF). C40 has the goal to have 1,000 cities adopt this framework and align to the Paris Agreement. To help them reach this goal, Realdania proposed implementing this CAPF on the national Danish level.

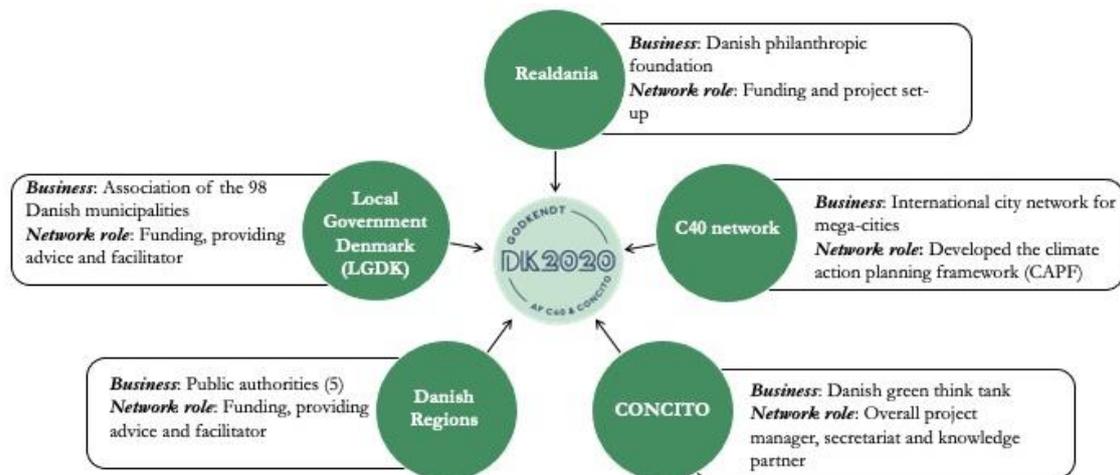
Stemming from this proposition, a new climate partnership called ‘DK2020-climate plans throughout Denmark’ (‘DK2020-Klimaplaner I Hele Danmark’ in Danish, hereinafter DK2020) was launched in September 2019. It is a joint project coordinated by Realdania, C40, and CONCITO. CONCITO is a Danish green think tank that has been helping translate knowledge into action in Danish municipalities since 2008. DK2020 is the Danish version of the Deadline 2020 report, making it the first time that this C40 CAPF standard is applied and further developed for smaller municipalities (Realdania, 2020a). It is also a first for the C40 network to be involved in a national initiative since they are not able to support other cities than their members in developing their CAPs. DK2020’s goal is to “*support municipalities in developing, upgrading or adjusting their existing work on climate action to global best practice, and ultimately developing CAPs in line with the 1.5 degree goal in the Paris Agreement*” (Realdania, 2020b). With this plan, all the municipalities adhere to a common method for preparing the CAP which makes it possible to compare results with other cities in and outside Denmark. All significant sources of GHG emissions are accounted for, thus aligning itself to the Paris Agreement (Realdania, 2020b). Additionally, it involves the preparation of GHG accounts and emission paths, and it has four main pillars: climate mitigation, climate adaptation, governance, and inclusivity. This network is expected to form the basis of a common system of climate work, especially between neighboring municipalities where efforts in selected areas like transport, mobility, and agriculture can be tackled through cooperation. The network’s goal is to develop initiatives, offer sharing of experiences and challenges, and a common platform to share a voice.

The small Danish municipalities are said to be involved in writing history in the fight against climate change by participating in this project (Realdania, 2020b). Denmark was partly chosen because Realdania, who is a major C40 funder, is based in this country. Realdania took the initiative for DK2020 and its ambition is to boost efforts to fulfill the Paris Agreement at the municipal level and support the cooperation between Danish municipalities (Realdania, 2020a). Even if DK2020 is technically a project-based network rather than an ongoing network, the impression is that it will be developing into one very soon. Currently, there is no organizational body to sort of hold or host municipalities that have completed their plans and have started implementation (Realdania representative (rep hereinafter)). However, the seven municipalities and online website articles have been referring to it in that way. For example, on the website or

CAPs of various municipalities, it is referred to as: “DK2020 climate cooperation” (Frederikshavn Kommune, 2021, p. 27); “the name behind a large climate partnership” (Middelfart) (klimalaboratoriet, n.a.); “an ambitious climate club” (Horsens) (Schütt, 2020).

When the project was launched in 2019, there was a call for membership application over three phases: i) the pilot project with 20 pilot municipalities (September 2019 to April 2021); ii) the first call with 46 municipalities (from November 2020 to April 2022); and iii) the second call for applications in April 2021 (officially starting in autumn 2021 to 2023). The municipalities of Frederikshavn, Middelfart, Sønderborg, and Høje-Taastrup are part of first phase, while Horsens, Ringkøbing-Skjern, and Skive are part of the second phase. As seen in Figure 4-1 below, there are five main actors formally behind the implementation of DK2020. The first phase of the project was led by C40, Realdania, and CONCITO. Since the second phase involved more municipalities, CONCITO trained LGDK and the Danish Regions to aid in supporting the municipalities in adopting their CAP. For DK2020, the municipalities have pooled resources together to hire a joint municipal climate coordinator (called Geographical Organizations) to handle climate technical assistance. During the process of adopting the CAPF, both the Regions’ and LGDK’s task is to provide advice to the members and facilitate their work in their CAP development (Realdania, 2020a). Realdania, the Danish Regions and LGDK have each funded 15 million DKK for a total of 45 DKK.

Figure 4-1. Composition of actors in DK2020



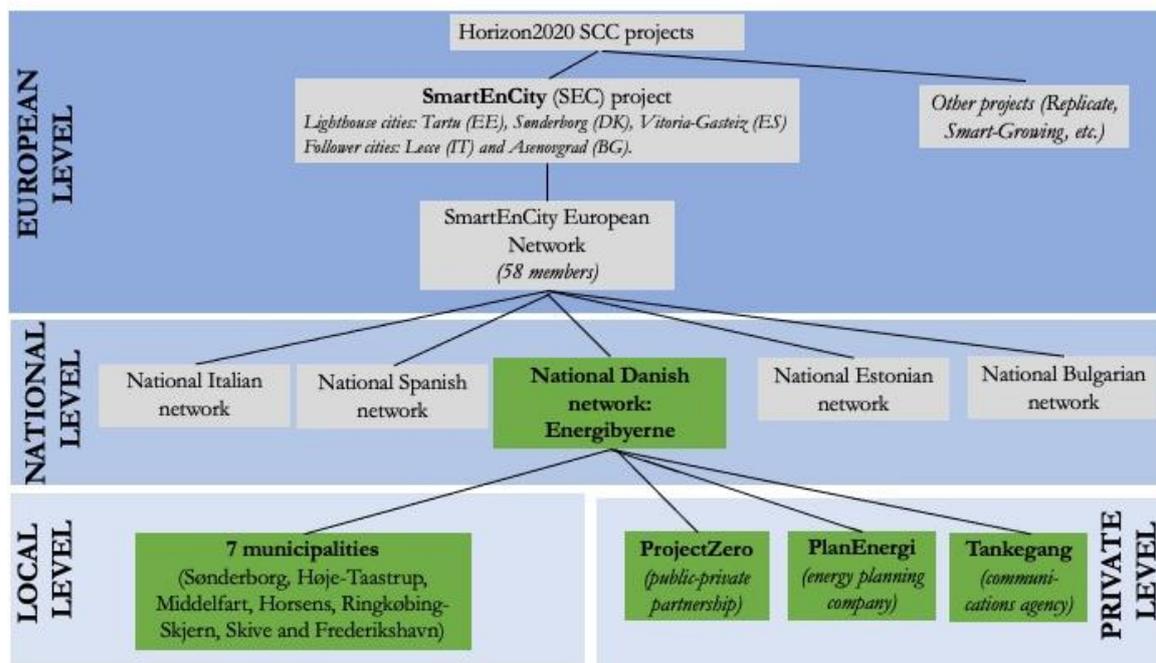
Source: Own elaboration

## 4.2.2 Energibyerne

Energibyerne is a Danish-based network of seven municipalities, two private companies, and one public-private partnership (see Figure 4-2). This network is part of the wider European network called SmartEnCity Network which is created as a result from the SmartEnCity project. SmartEnCity is an EU Horizon 2020 project that aims to develop “pan-European replicable strategies to reduce energy demand and maximize renewable energy supply with a special focus on small and medium-sized cities” (Rathje et al., 2018, p. 48). The project focuses on energy-efficient buildings, transition to renewable energy production, green transport, and IT (ProjectZero, 2020). To maximize the number of learnings from it, the SmartEnCity Network was expanded from five members to 58 city members. To do this, each of the five first municipalities were tasked with the objective of developing a local nationally based network. In Denmark, it was the lighthouse city of Sønderborg, represented by ProjectZero, and PlanEnergi that oversaw this recruitment. PlanEnergi (‘Plan Energy’ in English) is a Danish energy consulting firm that was partnered

with Sønderborg for the SmartEnCity project to support them with technical skills on energy accounts and renewable energy solutions. In Denmark, this resulted in a network which included the seven municipalities which were selected as “the chosen few who are in front of the bus” (PlanEnergi rep).

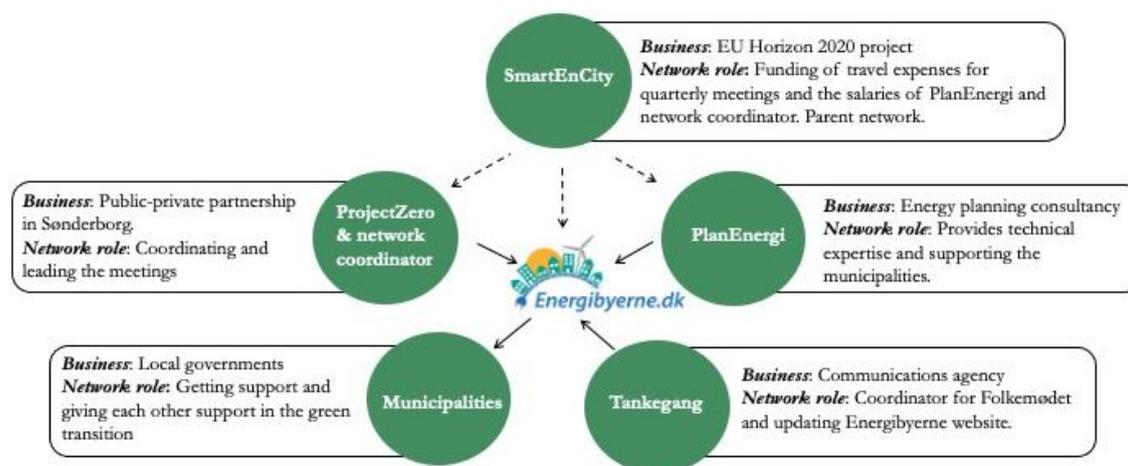
Figure 4-2. SmartEnCity project and its different operating levels (case study in green)



Source: Own elaboration

Energibyerne have been meeting on a quarterly basis for more than three years now. ProjectZero and the SmartEnCity network coordinator have been facilitating and coordinating these meetings. They are both the link between SmartEnCity and Energibyerne. Therefore, they act as a channel through which the accumulated knowledge circulates along with the funding. SmartEnCity plays an indirect role in Energibyerne and funds certain activities such as travel expenses for the quarterly meetings and the salaries of both the PlanEnergi representative and the network coordinator. The municipalities are paying for their common Energibyerne website which is managed by Tankegang. Each municipality has been the host of at least one of these meetings where they typically do an in-depth presentation of their municipality, their climate experiences, accomplishments, and challenges. They discuss how they can learn from each other and promote cities as climate transition drivers and, in cooperation, improve the national political framework (Rathje et al., 2018, p. 44). PlanEnergi and Tankegang have also been assisting to these meetings and have different roles. As of 2020, they have been focusing on joint project implementation. An overview of the main actors in Energibyerne is seen in Figure 4-3 where a dotted line indicates an indirect contribution by the actor and a full line is a direct contribution. Additionally, more background information on how Energibyerne was set-up can be found in Appendix VIII – Background information on Energibyerne.

Figure 4-3. Composition of actors in Energibyerne



Source: Own elaboration

### 4.3 The seven municipalities

This Section provides background information on the seven municipalities (the embedded units) that are analyzed within the two national networks (the cases). They are presented in alphabetical order. Table 4-2 presents some general characteristics of the seven municipalities and Figure 4-4 shows the geographical location of each of the municipalities. A more thorough overview of the municipalities is also given in Appendix IX – Overview of the seven municipalities.

Table 4-2. General characteristics of the seven municipalities

Municipality	Region	Population (inhabitants)	Population change (% vs. 2007)	Area (km <sup>2</sup> )	Population density (inhab./km <sup>2</sup> )	Danish Rural degree and EU Degrees of urbanization
Frederikshavn	North Jutland	59,039	-6.1	633	93	Rural (town and suburb area)
Høje-Taastrup	Capital City	51,729	10.8	78	661	Urban (town and suburb area)
Horsens	Central Denmark	92,229	16.7	519	147	Intermediate (town and suburb area)
Middelfart	Southern Denmark	39,116	6.4	299	131	Intermediate (rural area)
Ringkøbing-Skjern	Central Denmark	56,182	-3.3	1471	38	Remote (rural area)
Skive	Central Denmark	45,425	-6	684	66	Remote (rural area)
Sønderborg	Southern Denmark	73,831	-3.9	497	149	Rural (town and suburb area)

Source: Own elaboration (data from Social og indenrigsministeriet (2020))

Figure 4-4. Map of the seven Danish municipalities



Source: *Energibyerne website* (n.d.)

### 4.3.1 Frederikshavn municipality

Frederikshavn is in northern Jutland and is a rural medium-sized municipality. Over the last ten years, the population has been declining except in 2017 and the predictions for the coming years show a similar trend (Frederikshavn Kommune, 2021). With an annual decrease of 6.1% of its population, it is the municipality with the most significant decrease in studied municipalities. Frederikshavn's local economy has been shaped by its proximity to the sea. Around 50% of the municipality's income comes from their two harbors (Frederikshavn and Skagen). Through its ferry routes it is a strategic logistic gateway of Southern Scandinavian to continental Europe. The closing down of Danyard Shipyard in 1999, the largest employer in town, led to a rapid loss of local jobs. Since then, the municipality has sought to stimulate the local economy by taking advantage of their specific geographical conditions (i.e., wind turbine potential). They have several companies involved with delivering products for the wind turbine sector. The municipality's largest private workplace is the slaughterhouse Danish Crown (Frederikshavn Kommune, 2021).

When the Danish energy experts conducted research on the energy future of Denmark in 2006, they designated Frederikshavn as the Danish municipality with the most potential to become Denmark's renewable energy city and contribute to the then national goal of 100% renewable goal (Energy City Frederikshavn, 2012). Three main reasons were listed: they were an acceptable size for commercial demonstration units, they had the ability and backing to carry out ambitious projects and finally, they already had an existing research facility for marine windmills (GO100percent, n.a). Derived from this proposition, the municipality initiated a business and development team called 'Energy City Frederikshavn' which aims to convert the area's energy consumption to 100% renewable energy by the end of 2030. This team's task is to initiate, facilitate, and coordinate projects contributing to creating green growth and new local jobs in the energy sector. Energy City Frederikshavn is funded by a combination of a basic grant and external project funding from regional, national and EU funds. The projects being undertaken are driven on a commercial basis (e.g., as pilot projects or other funding) (GO100percent, n.a). Within the project team, there are three people, who answer directly to the municipal director.

Furthermore, the interviewed climate manager has been the Project Director of this team for ten years now.

### 4.3.2 Høje-Taastrup municipality

Høje-Taastrup is located about 20 km west of Copenhagen and is part of the Greater Copenhagen Area. It differs from the other six municipalities by being landlocked and the only urban municipality with 51,729 inhabitants. During recent years, they have experienced a growth of companies and jobs (35,000 jobs locally) and many people commute to Høje-Taastrup every day, especially compared to the other municipalities. Major local businesses include IT and services, logistics and heavy goods transport, and regional retail. They have a lot of “*big companies with a lot of transport, with black energy*” (Høje-Taastrup rep).

The municipality started working on climate topics in 2008 when they adopted their first Climate Plan (2009-2013) with the goal to be fossil free by 2050. For the municipality, “*growth and climate issues go hand in hand*” (SmartEnCity, 2017). This work has been led by a small team of four people working with energy planning and climate issues in broader terms within the Planning and Environment department. The interviewed climate manager has been leading this team since 2013. Since their first climate plan, the team’s efforts have mainly been focused on four areas: energy efficiency, electricity supply, heat supply, and transportation (SmartEnCity, n.a). This reflects their main sources of emissions (transportation, energy, and heating). Transportation has the bulk of the emissions since Høje-Taastrup is a traffic hub with its combined terminal for freight transport and logistics companies, train stations, and two highways crossing the municipality (Høje-Taastrup Kommune, 2021).

### 4.3.3 Horsens municipality

Horsens is situated on the east coast of the Jutland region. With its 92,229 inhabitants, it is the 12<sup>th</sup> largest municipality in Denmark and by far the largest one in Energibyerne in terms of inhabitants (see Table 4-2). It has experienced a major population increase since 2007 (16.7%), compared to the national average of 7.2%. This population growth has been coupled with business development and industries moving there. Locally, there are many graphics design and electronic companies and a university college.

Moreover, the municipality started engaging with climate issues in 2010 when they became a ‘Climate Municipality’ by signing the agreement with the Danish Society for Nature Conservation (‘DN klimakommune’ in Danish). They agreed to reduce CO<sub>2</sub> emissions by two percent every year for emissions falling under the ‘municipality as a company,’ meaning a climate goal for the municipality’s own activities as a company (e.g., municipal buildings, their car fleet). Located at connection point of three fjords, the town of Horsens is threatened by floods because a major part of the town center is lower than 1.5 meters above the normal sea level in the Horsens Fjord (C2C CC, n.a.). With rising sea levels, increasing precipitations and more powerful downpours, urgent action is required to protect the town against flooding. To take action, coordination is required with municipalities higher upstream. Central Denmark Region has been leading a coast-to-coast climate challenge (C2C CC) partnership project for intermunicipal climate adaptation action. The interviewed climate manager has been working for over 13 years in the Environment and Technical department and has had the role of the Secretariat of the Technical department since 2014. One year ago, they created the new role of a Climate Secretariat. However, this person does not work full time in this role and is the leader of another department. This was done to increase the level of embeddedness of climate and sustainability in the work of all the teams in the department and better coordination between them.

#### **4.3.4 Middelfart municipality**

Middelfart is the smallest municipality of the seven municipalities with a population of 39,116 inhabitants and it is the only one located on the island of Funen. It is considered a suburban municipality of Odense, the fourth largest municipality in Denmark. Middelfart municipality is the largest employer in the local area, with around 3,700 workers.

Middelfart started to engage with climate-related issues in 2007 because of the merger with other smaller municipalities. The formation of this new municipality made them think about what their vision was going to be. They created the Climate Laboratory which is the overall name of the projects dedicated to addressing climate challenges. The development of this Climate Laboratory aims for three main goals: i) making Middelfart a great place to live; ii) making Middelfart the green growth municipality of Denmark, and iii) focusing on concrete results (Middelfart Kommune, n.a.). The person leading this agenda, i.e., the interviewed Climate manager, has been the Head of Climate and Energy since 2007. He is placed centrally within the organization as a staff function, with the goal of providing advice and guidance to the Technical Director.

#### **4.3.5 Ringkøbing-Skjern municipality**

Ringkøbing-Skjern is a coastal municipality, and it is a remote type of municipality. As a result of the merger of five municipalities, it became Denmark's largest municipality in geographical terms, and it has the lowest population density (38 inhab. /km<sup>2</sup>) compared to the other six municipalities (see Table 4-2). The green energy sector in the municipality consists of around 60 companies with a total of 4,000 employees (Hegelund Jensen, 2020). By far the biggest employer is Vestas, a global leader for wind turbines, that was founded in Ringkøbing-Skjern.

The municipality started to engage with climate issues in 2008 when the local city council adopted its first energy policy called Energi2020. Energi2020 is the municipality's vision to be self-sufficient using different types of renewable energy by 2020. It is the only municipality that has a target for renewable energy or fossil-free, while the others have a geographical climate goal (i.e., climate target for the municipality total geographical area). Its latest strategic energy plan covers five main themes: renewable energy sources; energy and heat supply; energy consumption; business growth; and value for citizens and business (Ringkøbing-Skjern Kommune, 2015). The municipality has taken advantage of the large surrounding areas to deploy renewable energy, especially wind power. It now produces 10% of the total Danish renewable energy coming from wind turbines, while it only represents 1% of the total Danish population. This Energi2020 policy is embedded in an Energy Council, fully financed by the municipality, made up of 18 members including business stakeholders, representatives from Central Denmark Region, politicians, and civil servants from the municipality. Only two members are representatives from the city council: the Head of the Energy Secretariat and the chairman. The interviewed climate manager has been the Head of the Energy Secretariat for over 12 years now and is placed in the External Development department.

#### **4.3.6 Skive municipality**

Skive is a remote mid-sized municipality located in northwest of Jutland. Populated by 45,425 inhabitants, the municipality has been experiencing a yearly decline of 6% of inhabitants. These migration waves have mainly been due to employment and studies. The public sector is the main employer in this municipality (i.e., public administrative, education and health sectors) followed by trade, transportation, food services, and manufacturing.

Due to their early climate efforts, in October 2008 the municipality was officially appointed by the former minister of Climate and Energy, Connie Hedegaard, as one of Denmark's first

‘Energy City’ (Energibyer in Danish), along with Kolding and Copenhagen. This title was given to municipalities that had proven to be frontrunners in the climate and energy fields (Energibyten Skive, 2020). Following this, the team of ‘Energibyten Skive’ was established, located in the Planning, Technology, Environment and Development department which encompasses both the technical side but also the business opportunity side. This team is 30% financed by the municipality while the rest comes from national government and EU funding (City assessment). For little over a year, the climate manager respondent has been the leader of this six-person team. They exclusively do project-based work related to reaching the municipality’s goal of being CO<sub>2</sub> neutral by 2029 (Skive Kommune, 2021). Their Climate and Energy Strategy has four main focus areas: green renewable energy, energy efficiency, responsible consumption and production, and green transport (SmartEnCity, n.a.). By taking advantage of their structural characteristics of being a rural and remote municipality, they are using alternative energy sources such as solar, wind, and hydrogen power. For example, they have developed GreenLab Skive which is a business development park with a symbiotic set-up (Power-to-X) where surplus energy and waste is used for gas in district heating and transport. Power-to-X which is a technology that converts green power from wind and solar into hydrogen via electrolysis.

#### **4.3.7 Sønderborg municipality**

Sønderborg is a coastal southern Danish municipality close to the German border. It is the 16<sup>th</sup> largest municipality in Denmark with 73,831 inhabitants. Since 2007, they have been experiencing a decreasing population of 3.9% since 2007. This trend is expected to persist in the coming years coupled with an increase in elderly people and a decrease in the proportion of working population (Sønderborg Kommune, 2020). Sønderborg is a rural municipality with urban city characteristics since is the home of green technology companies like Danfoss, one of Denmark’s largest industrial companies, and Linak, that makes key components for wind turbines and solar PV installations. Additionally, agriculture is a significant industry sector, especially animal farming, for the Sønderborg area. There are approximately 200 active agricultural holdings and various food processing companies, as well as the Danish Crown, one of the biggest pig slaughterhouses in Denmark (Sønderborg Kommune, 2020). They also have around 300 small and medium-sized companies.

Sønderborg’s city council decided to act on climate change in 2007 when they established ‘ProjectZero-transition to a carbon neutral community by 2029’, a public-private partnership (PPP) between Sønderborg municipality, the municipal utility company, University of Southern Denmark (SDU), and a few private actors. The private actors make financial contributions to this foundation. Viewed as an extended arm to the municipality, it was established to support and coordinate Sønderborg’s transition to carbon neutrality by 2029 by mainly focusing on the energy transition. There were two climate managers from this municipality were interviewed: one from the municipality and one from ProjectZero. The former is the head of Sustainability, Nature and Rural Affairs and has been working for the municipality for 12 years. The latter has been the CEO of ProjectZero for 14 years now and is one of the founders of Energibyterne.

## 5 Results

This Chapter presents and analyzes the results. In Section 5.1, the municipal level is analyzed, looking at the key factors affecting climate policy implementation, following the first analytical framework. This is followed by Section 5.2 where the network level is analyzed to determine key functions of the networks utilized by municipal climate managers, following the second analytical framework. Section 5.3 combines the two previous Sections to answer the overarching research questions following the theory of policy entrepreneurship.

### 5.1 Comparative analysis of the municipalities

In this Section, a comparative analysis of the seven municipalities will be conducted to identify the critical factors affecting the implementation of climate policy. Using the analytical framework for the municipal level, three conditions will be used to analyze and compare the seven municipalities: local governing capacity, political actors and factors, and local framing of climate policies. This aims to answer the first sub-research question of this thesis:

- SQ1: What are the key factors affecting the implementation of climate change policies in small and medium-sized municipalities?

#### 5.1.1 Local governing capacity

The four aspects of local governing capacity will be used to analyze the seven municipalities. These four aspects are essential to be taken into consideration because together, they determine key areas where a municipality should prioritize taking actions. Actions should be taken in areas where the impact is the highest in terms of reducing emissions but also where the municipality has a high capacity to undertake them. Emissions include all those enclosed within the geographical boundaries of the municipalities. In other words, it encompasses not only those being generated by the municipality as an organization but also emissions generated by other actors within the municipality.

#### **Legal competences**

Legal competences can influence the power municipalities have to take climate actions. In Denmark, climate efforts are largely a voluntary municipal task: “*It is widely accepted that even though [reducing carbon emissions] is not a ‘shall do’ or a ‘must do’ task, we call it a ‘can do’ task.* (ProjectZero rep). This means that even though climate does not fall directly under the local authorities’ purview, it can be linked to or embedded in the other competences the municipalities do possess or in areas they have authority over. For many of the municipalities, a large proportion of their sources of emissions comes from the energy sector and it is thus an area with high reduction potential. Key competences used for integrating climate efforts to reduce these emissions is through their municipal authority to develop strategic energy plans and their decision power over land-use planning. Many of the municipalities have used these competences to take action and have used their powers in strategic land-use planning to install renewable energy sites. This can be seen especially in the larger geographical municipalities in Jutland that have undertaken wind turbine projects (Frederikshavn, Sønderborg, Skive, and Ringkøbing-Skjern), and biogas production from farming activities (Frederikshavn and Skive). While Horsens does not have as much space for wind turbines due to a high building density (Horsens Kommune, 2011), they have nevertheless exploited their power to green the sources in the district heating supply. This was possible since the district heating company is owned by the municipality, while for other like Sønderborg, these utility companies are citizen-owned and thus, the municipality cannot use their authority to govern over these activities. Likewise, Høje-Taastrup also has a large proportion of emissions coming from the energy sector, mainly from heat and energy supply. However, renewable energy production is not a large-scale solution that can be implemented

since it is a very small and densely populated municipality: “Here, if you have some space, it is either for a recreation area or for building new homes or building new companies or road.” (Høje-Taastrup rep). As for district heating, they also have limited powers since electricity and heating stations are shared with 17 other municipalities within the Greater Copenhagen area.

For climate adaptation, all the municipalities have adopted a climate adaptation plan following the national requirements which made it mandatory include it in their spatial planning competences. However, climate adaptation is often a task needed to be coordinated between municipalities for efficient solutions to take place. This has been the case in Central Jutland Region where the Region has been coordinating the municipalities in the C2C CC project. Horsens and Skive are part of this initiative, while Ringkøbing-Skjern decided not to join. However, while this Region has taken on more the role of coordinating efforts between municipalities, this has not always been the case in other Regions since it is a that has been taken up on a voluntary basis.

Overall, the municipalities have been taking climate actions in areas where they have both a high legal capacity for actions and a high potential for reducing emissions or climate impacts. Even so, some critical sources of emissions are currently not being addressed by municipalities due to a mismatch between the sources of emissions within the geographical boundaries of the municipalities and their legal authority over the emissions. For example, these municipalities also have many emissions coming from agricultural production within their geographical emissions scope. However, they do not have legal authority over the agriculture activities (except through land-use planning) which leads to this mismatch. To reduce those emissions, it would involve collaborating with the farmers and businesses since legal competences for agricultural activities fall under the State’s jurisdiction. All in all, municipalities only have legal authority over their own businesses, which only account for a small portion of their geographical emissions. Thus, the municipality’s ambitious goals cannot be reached without the heavy involvement and acceptance of local stakeholders like utilities, farmers, housing associations, and private businesses.

### **Human resources**

Three main elements associated to the human resources were found to have an effect on the implementation of the CAP throughout the interviews. The first element is the type of administrative structure that coordinates the climate agenda implementation. Typically, there seems to be two common administrative structures for the municipalities’ climate team: they are either located directly under the Technical and Planning department or in the External Development department. The first set-up is found in the three municipalities of Høje-Taastrup, Horsens, and Middelfart where their “offices, making environmental or energy subjects, are a ground part of the municipality” (Horsens rep). This shows that climate mitigation for these municipalities is regarded as an environmental issue that requires technical expertise. The second set-up is found in the four municipalities of Frederikshavn, Ringkøbing-Skjern, Skive, and Sønderborg. This demonstrates that climate mitigation is perceived more as a development opportunity than a problem. By having a joint venture between the municipality and external actors, it gives the civil servants more freedom and autonomy “instead of working under certain rules” (Ringkøbing-Skjern rep). While Sønderborg’s planning team has the Planning set-up, they also have the public-private partnership organization of ProjectZero. By being outside of the local government structure and being paid by private foundations, it gives the ProjectZero’s CEO a lot more liberty for actions and fewer financial constraints for the implementation of the agenda. Another interesting case is the team of Energibyen Skive, which is located in a department that “encompasses both the technical and environmental sectors but also the business development sector. So, [they are] in a muddy landscape between those two areas.” (Skive rep). The six civil servants in the team “actually have a pretty broad mandate to move forward with projects without having to take it up the system. [They] can

*actually get going if something makes sense.*” (Skive rep). In sum, these municipalities have anchored the local climate agenda by the involvement of the private sector.

A second relevant element in the human resources was if there was a central climate manager leading the climate agenda and being responsible for coordinating it with other actors. A sharp contrast was found in that all the municipalities have a dedicated full-time climate leader except for Horsens. Despite their larger size, they have a more fragmented and disconnected approach in their climate leadership. While they have a newly established Climate Secretariat, but sustainability is not their main line of work. This has repercussions on the level of autonomy and freedom the climate manager and her peers have regarding climate actions.

A third element was if the climate agenda was coordinated across other departments. It seems that most municipal organizations have kept a hierarchical and siloed type of approach in the department separation. In the External Development department set-up, there is a certain coordination with other departments since they are typically the ones implementing the climate agenda and are not in charge of planning and writing up the CAPs. An exception to this is in Frederikshavn where the Energy City Frederikshavn team is also responsible for writing up the CAPs and where there seems to be less coordination with other departments. Moreover, Middelfart seems to be the exception to having the implementation of the CAP dedicated to one department. Rather, Middelfart’s political organization has aimed to embed sustainability within all the departments. Therefore, the Head of Climate is more a “*Jack of all trades, master of none*” who is “*floating around the whole system*” (Middelfart rep), meaning that this civil servant acts like a coordinator of the climate agenda across the different departments. It also seemed necessary that his role entails certain powers by having him placed in a higher position in the organization and is connected to the top management.

In essence, there is a striking difference between the two types of administrative structures. Climate managers located in the External Development department and the municipalities that have a joint venture with the business sector have both a broader scope of areas to take climate actions and they also exercise a higher degree of autonomy in their mandate. Whereas those in the Technical and Planning departments have a narrower scope for action limited to what the municipality as an organization can do (as a local authority and a service provider), and they find it harder to go beyond that.

### **Financial resources**

There is no available overview of the scale of funding reserved for climate actions in municipal budgets. However, one could assume that the less financially restrained municipalities might be more capable of investing in climate actions. Thus, general financial resources of the municipalities mainly consist of taxes on property, income, and corporations. An overview of the net operating income of the seven municipalities is found in Overview of the seven municipalities, which ranges from DKK 4,700 to DKK 10,029 per inhabitant. The interviewee from Middelfart explained that for his municipality, climate and sustainability were incorporated in the forthcoming budgets of the whole municipality which did not seem to be the case for all municipalities. If this was not the case, the climate managers “*have to ask the politicians for every cent, penny, euro, or dollar*” (ProjectZero rep), which can slow down and hinder the implementation of climate policies. However, this financial dependency can be avoided by having a public-private partnership like ProjectZero where “*the administration bill is partly paid by the municipality, the Danfoss foundation, the utility companies, and the EU project.*” (ProjectZero rep). One of the interviewees claimed that because of this set-up, ProjectZero had more resources than for instance Odense and Aalborg, two of the biggest municipalities in Denmark. While this is a rare set-up, a more common approach is to receive funding through EU projects. PlanEnergi’s representative explained that the seven municipalities had quite some resources for climate projects because

“they have been doing projects in this area for a while now, they have gotten money from the outside from EU, very often from INTERREG to finance their various activities.” By having financial resources from diverse sources, the climate managers are less dependent on annual public budgets for implementing climate actions. For example, Ringkøbing-Skjern has received EU funding through their COBEN project, enabling them to offer 1,016 energy checks to citizens. While EU funds can provide an alternative to a lack of municipal resources, the application process can be quite time intensive to fill out and reserved for certain projects. Thus, for green investment projects falling under the municipality’s responsibility, public funds need to be allocated in the municipal budgets. This shows that having financial resources available to take climate actions depends on political alignment to the green transition agenda and that a significant lack of these can seriously impede the implementation of the climate policies.

### **Information and data management**

Access to information and data is also said to have an influence on the implementation of the climate policy since it can hinder the information required to take appropriate action. Since there is not a comprehensive data inventory in Denmark for what GHG emissions should be accounted for, there are some discrepancies in these procedures. For example, many of the municipalities only account for CO<sub>2</sub> emissions and did not include other GHG emissions. This makes a significant difference in the total emissions, especially in municipalities with a lot of agriculture activities. However, many of them are now using a GHG planning tool aligned with the Paris Agreement that was recently developed by the energy consultant PlanEnergi. In Central Jutland Region, where Horsens, Ringkøbing-Skjern, and Skive are located, they have a higher rate of updated inventories since the Region has coordinated it with their municipalities and PlanEnergi. Preparing CAPs with the appropriate data can be very time consuming for municipal staff because the amount of effort does not fluctuate with the size of the municipality. As a result, it puts more pressure on smaller municipalities who would be spending most of their time on planning climate actions rather than implementing them.

Having available information to better plan is also crucial for climate adaptation. Some municipalities have explained not been able to revise their climate adaptation plans in time due to a lack of important climate data (Frederikshavn Kommune, 2021; Middelfart Kommune, 2020; Sønderborg Kommune, 2020). This data is supposed to be provided by the national authorities such as the Danish Meteorological Institute (DMI) and the Danish Data Agency (SDFE in Danish), but they were not able to make detailed data available on time. A lack of capacity for local governments to generate and manage data or lack of access to it can seriously hinder and delay the planning process of climate actions. This is important because if the scope is not wide enough, significant GHG sources and climate impacts can be overlooked, and lead to climate efforts being focused in less important areas.

### **5.1.2 Political and local actors**

This Section focuses on how the political and local actors affect the development of climate policy at the local level. There are three main political and social actors that are discussed below: businesses, citizens, and politicians.

#### **Businesses**

Many of the municipalities have taken advantage of the fact that their local industries are quite advanced on the climate front. The two examples of Sønderborg and Frederikshavn show the important role their existing green businesses have been in their climate actions. These important industries that have been actively participating in the green transition: “we have Danfoss and Linak who are working and making money with the green solutions” (Sønderborg rep). These partnerships have served to strengthen their municipal climate agenda internally: “It is a great

strength for Sønderborg that the area has a strong business community that has a growing interest in climate, energy, and sustainability. The business community is thus an important party in the transformation of the area.” (Sønderborg Kommune, 2020, p. 36). A very similar scenario is also found in Ringkøbing-Skjern, where renewable energy is a very strong component of the areas they are working with. Since they have a lot of open spaces, they decided to focus on greening the energy production and they are currently producing 10% of total wind power in Denmark. This was emphasized even more with the wind turbine producer Vestas, who employs around 4,000 people locally. Moreover, many of the municipalities have been collaborating with various businesses as a means of implementing the municipality’s climate agenda outside of their organizational boundaries and to facilitate these private actors to take actions. These businesses include district heating companies, farmers, and housing associations. These collaborations are deemed crucial as a representative explained: *“the whole point is that we are not going to be able to do anything ourselves as a municipal organization. Our role is to facilitate business development, facilitate relationships between different stakeholders. That is the primary role, especially our standing as in as a public authority.”* (Skive rep). Furthermore, businesses in these municipalities also seem to have a positive influence on the local climate policies since they are sometimes pushing for more actions from the municipalities and being more ambitious than them: *“the companies are sometimes ahead of the municipality. We have some big companies saying, ‘our goal is to be CO<sub>2</sub> neutral by 2025, why do you have only 50% in 2030?’ So, it is the other way around actually; it is the municipality that is lagging a bit behind in some areas.”* (Høje-Taastrup rep). This was also highlighted by the representative in Horsens who explained that *“the actors in the municipality are interested in collaborating. They know this coming up and they can see business opportunities in it. Sometimes the citizens and the companies are ahead of some our politicians and our system.”* Altogether, businesses have been a key positive factor affecting the municipal climate policy implementation.

## **Citizens**

Compared to businesses, the impact of citizens on the implementation of the climate policy has been mixed and differs per municipality. Overall, there seems to be a general trend of an increase in citizens’ awareness of the green transition and sustainability. At the same time, there is an unquestionable resistance from citizens towards wind turbines in all the municipalities with a renewable energy potential. One interviewee explained that when trying to get citizens on board wind turbine projects, *“It is not only a rock, but also a mountain you have to move.”* (Frederikshavn rep). Indeed, most wind turbine projects have encountered long delays or even had to be abandoned because of the strong resistance. On the contrary, other mitigation projects that have had strong objections from citizens but were nonetheless still implemented. To show, Horsens municipality led the conversion 10,000 households from natural gas to district heating, which was the biggest district-heating plan being done in Denmark. From the outside, this project was very well perceived and gave them a lot of praise. In the process, however, they encountered a lot of resistance from a small group of citizens that made a lot of noise and gave bad press to the politicians. The citizens were not against district heating itself, they resisted because they had not been engaged in the process since the municipality’s approach was: *“this is the way it is going to be. It is decided and we are going to rollout this district heating like whether you like it or not, and you cannot do anything about it”* (Horsens rep). While this had major environmental benefits, it will make it harder in the future to engage the local population in climate actions.

Another element influencing the development of climate policy is the citizens’ sense of belonging to the municipality. In Høje-Taastrup, there seems to be a lack of ownership: *“in the other municipalities, it is different how they cooperate with citizens. If you look at Sønderborg: people live there, work there, go there for recreation and shopping. But here, in the Greater Copenhagen area, you live in one place, you work in a second municipality, go shopping in a third, and you have some recreation activities in the fourth. So, the citizens’ feeling of being part of the municipality is different because here, they are switching borders between the municipalities a lot more.”* (Høje-Taastrup rep). On the contrary, the engagement and dialogue

with local citizens are seen as paramount in Frederikshavn so that they understand the reasons behind the climate actions undertaken by the municipality. Rather than opting for the traditional information meetings, they went for a more 'learning by doing' and 'leading by example' type of approach by creating two climate ambassador groups.

### **Politicians and level of politicization**

All the climate managers have highlighted how important the support of politicians is for their work in establishing climate actions. While some have had a high level of support, others have experienced some struggles. Across all municipalities, they have managed to get climate plans accepted by the city councils, a necessary step for a plan to become an actual policy. Thus, the planning phase of climate actions requires the acceptance of politicians while the implementation of the policy also requires the mobilization of the other political actors (civil servants).

In general, politicians attribute a high importance to citizens as they are the ones deciding if they will stay another political term, and to having lucrative businesses as this attracts people and more municipal tax revenues. In this line of thinking, politicians often align with these two social groups in their decision-making processes. The **political level of politicization** indicates whether climate change is an electorally salient issue. On the national level, the last elections were marked by climate change being a highly relevant topic. Indeed, the representative from Tankegang explained: *"if you go back by three or four years, climate and the green transition were left wing topics but now, it is all parties. It is just the new reality, that is what we have to do."* On a local level, the green transition has been more politicized in certain municipalities than in others. In municipalities such as Sønderborg and Ringkøbing-Skjern, there is a strong political alignment to the green actions being undertaken since 2007. Even if there have been changes in mayors and in political parties, it does not seem to have created a step back or had a major influence on the climate work. While this could seem as if it has not been important, it is because the climate agenda has been coupled with a relevant local issue. In these two municipalities, this support has been easier to have since it aligned with the strong presence of local green businesses with whom they could work together with rather than against.

In Frederikshavn, there is an underlying importance of the political legitimacy from citizens where *"I think it is very necessary [to have this dialogue with local citizens] because in our municipality, the local politicians they do not want to make decisions if the people will not follow them."* (Frederikshavn rep). This also reflects the important role citizens play for this municipality and the coupling with local job creation which *"is the main reason why there is such a commitment from the local politicians."* (Frederikshavn rep). This was even more important with the closing of the shipyard who was at the time the largest local employer. This is also the case in Skive where *"It is not enough to just talk about making it greener for the climate, we're not fanatics in that sense, but it has to make sense in that broader perspective and that's a core principle in the way that we work anyways."* (Skive rep). This broader perspective is oriented more towards developing business projects where climate actions are linked to benefits like business growth, cost savings or increased revenues.

For the municipalities of Middelfart and Høje-Taastrup, there has been a growing level of commitment to the local climate agenda, but the politicians seemed a bit more conservative in their approach. In other words, they had to be convinced of the short-term gains of the climate policy or it had to be linked to other non-environmental benefits like cost savings or better air quality. In Middelfart, there seems to not have been a strict agenda of where the climate initiatives should take place (compared to the others previously mentioned), whereas the importance was assigned to making concrete results. The climate manager from Middelfart explained that: *"because if there is one thing our politicians endorse, it is concrete results. This is what I am dealing with every day: I have to be making concrete results, because I also know that they need more*

*schoolteachers. So, this is the burning platform: make some concrete results.*” This reflects a rather short-term perspective where the climate actions currently being undertaken have to show their positive gains in a near future. However, this was necessary to build legitimacy of the climate work and get the approval from politicians. In Høje-Taastrup, the business case seems to have been the main driver for projects: *“when the municipality should decide to implement a green solution compared to just moving on with the same business-as-usual, it is always a question of money.”* (Høje-Taastrup rep). Thus, climate actions need to be associated with quick and high investment returns. An interesting case is the one of Horsens where climate has not been a politically salient issue, even if the municipality has experienced some serious impacts from flooding over the last couple of years. The politicians’ recent interest has been driven by external pressures from international and national levels on climate change and not wanting to be perceived as lagging.

A clear indicator of this level of political alignment and politicization can be seen by looking at whether the municipality has a separate website to portray their climate initiatives. In fact, Skive, Middelfart, Sønderborg, Frederikshavn, and Ringkøbing-Skjern have a separate website whereas Høje-Taastrup climate actions appear in a separate Section of the municipality’s homepage and Horsens’s action are not displayed anywhere. In sum, there is a strong alignment to the green transition in Sønderborg, Ringkøbing-Skjern and in Middelfart. In Skive, Frederikshavn, and Høje-Taastrup, climate actions have to be coupled with other benefits like business growth, citizen acceptance or a strong business case to be accepted by politicians. While in Horsens the topic is not politically salient for now.

### **5.1.3 Local framing of climate policies**

This Section presents how local climate policies are being framed in a way that leads to the acceptance and implementation of the climate agenda. Local framing has been a key factor influencing the acceptance of the local climate agenda thus leading to more implementation. There are two main ways to frame climate policies: either tuning it to an already existing local issues or coupling it with other benefits.

#### ***Climate policies linked to local issues***

Linking climate policies to local issues has been used for both climate adaptation and climate mitigation. Depending on which it was, it influenced whether it was framed as a problem or as an opportunity.

When compared to climate mitigation, adapting to the effects of climate change is framed in a more negative and reactive tone and as a threat instead of as opportunity. Indeed, with Denmark seeing the effects of climate change across its country, it has helped convince citizens of the need for action: *“the effects of climate change being much more visible has helped with a lot with the debate. Ten years ago, people that were a bit more skeptical were saying: ‘can it be true? Is it so bad if we are all safe?’ Now, when we have flooding, storms, extreme weather, and heat waves here and in other countries, more and more people can see it is very, very serious and it helps.”* (Sønderborg rep). This ‘reactive’ framing is also seen in Horsens municipality where climate adaptation has been more of a focus *“probably because it is more needed. When you overflow, it is not very good. I think for that reason it has been more focused.”* (Horsens rep). Overall, all the municipalities have been more in a reactive state when engaging with climate adaptation. All the municipalities have gotten their first climate adaptation plan as consequence of the national regulation demanding municipalities to adopt and plan for climate change impacts.

Furthermore, linking climate mitigation policies to local issues was used by the four municipalities of Sønderborg, Skive, Frederikshavn and Ringkøbing-Skjern. What all of these municipalities have in common is that they have been faced with a shrinking population since 2007 (see Table 4-2). Thus, their climate policies have been framed as a potential for green

growth where they attempt to foster economic growth and environmental development simultaneously. Depending on the municipality's area of interest, it influences the environmental policies. From the seven municipalities, two areas of interest were identified: i) job creation and municipality's attractiveness for firms and workforce; and ii) local production of goods and services.

The first area of interest involves stimulating jobs that reduce negative environmental externalities and impacts. Frederikshavn's main priority is to stimulate local job creation to overcome the losses caused by the closing of a shipyard in the 1990s. Even if the shipyards have closed, they still use the ports to offer various services. At the moment, they are investing a lot of money to expand the activities and services linked to the ports such as using them for terminals for biofuels and recycling, offshore rigs (repair, maintenance, and scrapping), and the construction of piers for installing coastal wind turbines (Frederikshavn Kommune, 2021). The local industry made a forecast that this has the potential for generating 1,000 new jobs locally (Frederikshavn Kommune, 2021). In 2020, the city council adopted a new development strategy where four growth tracks were identified for job creation. One of these growth tracks is 'energy and recycling' (Frederikshavn Kommune, 2021). While the other municipalities also are all aiming to create jobs, they are using another means to stimulate it like attracting business whereas Frederikshavn is developing areas they own. Making the municipality an attractive place to live and work has been a focus for Sønderborg. Indeed, they try to reconcile simultaneous concrete challenges while also strengthening skills, growth, and job creation: "*It is about making the Sønderborg area a more attractive place to live and work, and it is about putting Sønderborg on the world map and contributing to local pride and growth.*" (ProjectZero, 2020, p. 5). The focus on the green transition has helped them to improve their situation: "*Of course, we have problems too, but if we look at our neighboring municipalities, they have bigger problems than us.*" (Sønderborg rep). Thus, it is both about trying to keep citizens from migrating to other municipalities and to attract new ones.

The approach of the municipalities regarding the local production of green goods and services has been seen in Skive, Sønderborg, and Ringkøbing-Skjern. On the one hand, Skive has a clear focus on greening the business sector: "*This was the way that we coupled the greening of society with the greening of the business landscape of Skive and that continues to be our primary focus*" (Skive rep). Since it is mainly an agricultural municipality, Skive has focused on biogas which is reflected in their circular economy project of 'GreenLab Skive.' Their approach to tackling climate change through local development led to an increase in the support from citizens and employers, which in turn pleases politicians. On the other hand, Ringkøbing-Skjern has instead been collaborating with the existing local green businesses. Ringkøbing-Skjern, where renewable energy is a very strong component of the areas they work with. Since they have a lot of open spaces, they decided to focus on greening the energy production. This is seen in their Energy2020 policy which has the vision centered on making the municipality self-sufficient with renewable energy by 2020 (Ringkøbing-Skjern Kommune, 2015). This was emphasized even more with the wind turbine producer Vestas being in their municipality.

### ***Climate policies generating co-benefits***

The other three municipalities have opted for a different approach of linking the climate policies with other benefits. These three also have different structural conditions as they have all experienced a population increase and are classified as being urban or intermediate (see Table 4-2). This approach is also different from the previous one because green growth requires a potentially already green sector to collaborate with. However, this was not the case of all municipalities. Indeed, Høje-Taastrup is an attractive place for logistics and transport companies and IT data centers, which are highly intensive carbon industries. Since they could not couple their climate policies with these local businesses, they have opted for climate actions that reduce environmental impact and allow for cost saving options. For example, they have increased the

energy efficiency of their municipal buildings and coupled the environmental benefit of lower energy consumption and emissions with reduced heating costs due to better insulation. Additionally, the local district heating company, in collaboration with the municipality, is planning to utilize surplus heat for district heating coming from a large data center (Høje-Taastrup Kommune, 2021). In Middelfart, they have on boarded different topics related to the green transition. The climate agenda has been linked with the municipality wanting to be an environmental leader for Danish municipalities. This can be seen in the city council's vision "*Middelfart Municipality will be one of the Danish municipalities that go down in history as one of the most proactive climate municipalities in the work to achieve the goals of net-zero emissions. We want to be Denmark's leading climate municipality [for smaller local communities]*" (Middelfart Kommune, 2020). This is also reflected in their approach which has been more bottom-up with a strategic focus on making networks and collaborations. The representative explained that they had a more "*happy-go-lucky way to work*" and placing importance on projects that "*provide concrete results and is doable.*" In Horsens, the conversion of their heating system from black energy sources to green district heating has been linked to environmental benefits and the benefit for future generations. It also led to a lot of external recognition and praise of their efforts.

#### 5.1.4 Summary of results

To summarize, each of the municipalities have experienced or are experiencing some difficulties or constraints with regards to the implementation of their climate policy. This could have been caused internally due to a lack of governing capacity (legal, human, financial, or informational barriers) or due to political actors and factors like a lack of political will, resistance from social groups, or the presence of carbon intensive local industries. The key factor of 'political and local actors' seems to reflect the actors who are the key motivators of local climate action. The level of political support has an influence on many of the other factors previously analyzed since they make the decisions on the administrative structure of the climate departments (if they have a strategic or conservative role), along with the scope and mandate of the climate manager's job description, and how much financial resources are being allocated to climate actions. For the municipalities attributing a lot of importance to business development (Sønderborg, Ringkøbing-Skjern, Skive), there seems to have been politicians more open to taking risks and tolerating uncertainty. This is reflected in the administrative set-up of the municipalities who are located in the External Development departments and have more project-based work. Lastly, the local framing of the climate policy also seemed to have a major impact on the implementation of the climate agenda by either linking it to local issues or by having other social or economic benefits associated with it.

## 5.2 Comparative analysis of city network functions

In this Section, a comparative analysis of the two city networks of DK2020 and Energibyerne will be conducted to identify the functions of the city networks that are perceived as most valuable for the municipal climate managers. Thus, this aims to answer the second sub-research question of this thesis:

- SQ2: What are the main functions of national city networks used by agents in small and medium-sized municipalities?

### 5.2.1 Enabling direct exchange

By far the most named benefit for Energibyerne was the knowledge exchange and the personal network it created for them, which aligns with the 'direct exchange' function.

During the Energibyerne meetings, the municipalities "*have a presentation of what they are doing, then they discuss how they do, good ideas they have, come up with other ideas they could do.*" (PlanEnergi rep). For

example, they discuss various topics and exchange best practice stories on ICT, citizen engagement, district heating, circular economy, and transport. These recurrent presentations seem to have brought them to a higher level of interaction. It gave them knowledge on what each of them are experts in, their different experiences with certain projects and they got to know each other on a more personal level and now *“they are good friends and good colleagues”* (Ringkøbing-Skjern rep). This helped to build this sense of trust and mutual benefit between themselves: *“You can say anything in the meeting, I think that trust level is very high. They listen to each other very much.”* Moreover, it is mainly knowledge and ideas that are being exchanged between the climate managers. These exchanges occur both ways: *“to get inspired from the others...and also to inspire others with our way of doing.”* (Ringkøbing-Skjern rep). Knowledge exchange is also seen as a way to get feedback and confirmation to *“if our idea is the right way of doing things”* (Høje-Taastrup rep). The fact that they are located in the same country, has facilitated this exchange: *“they have the same language, the same boundary conditions, same traditions, so they can exchange experiences in an easier way.”* (PlanEnergi rep). They also have similar challenges due to their size. Furthermore, the differences between them, particularly the fact that they are spread out across the country, makes it even more valuable since they rarely collaborate with municipalities outside of their region. This provides them *“with new input and new ways things could be developed.”* (Høje-Taastrup rep).

They also seem to have gone beyond the exchange of ideas and study visits to a higher level of helping each other out when they have a problem. As a matter of fact, these recurrent meetings have strengthened their relations with one another, and it has become this personal network. Before this network, they knew each other but they had not really collaborated on a formal level. Through the network, many of the actors (from Høje-Taastrup, Horsens, and Skive) mentioned the benefits of getting personal contacts. To demonstrate, Horsens’s Climate manager explained: *“I think it is very valuable for my work that I have a great network. If Energibyerne is really special to that, I do not know, I think it is the persons, the possibility to have these relations with other municipalities, that is a very important thing.”* However, Middelfart’s climate manager already had a good network with some of the other municipalities and, as such, seemed to have perceived less value from it.

The direct exchanges in DK2020 have not yet really taken place because of COVID-19. There are some conferences and webinars but due to the online set-up, interactions between climate managers are limited. However, one of the civil servants highlighted the future direct exchanges that will derive from DK2020: *“Simply by putting people in the same room and giving them the same homework at the same time will foster new coalitions springing now out of the DK2020.”* (Middelfart rep). Moreover, DK2020 has also been creating external networking opportunities for the municipalities. In the CAPF, it is a requirement that the plan is formulated in collaboration with key stakeholders in the public, business, and civil society. For the municipalities that are more advanced in their collaboration with the private sector, this benefit was not raised. However, other municipalities (Høje-Taastrup and Horsens) perceived that this new CAP with DK2020 could create new opportunities for this type of collaboration. A similar benefit was also highlighted in Horsens where they have recently had the first meeting with external actors for potential collaboration: *“everybody in companies, in education and in research, they want to work together, and they just need a platform to do it in. So, I think that DK2020 will be this platform where they can meet in Horsens municipality.”* (Horsens rep). In summary, direct exchange from Energibyerne is beneficial because it creates these relations with other colleagues and to share knowledge with as a potential alternative to a low number of administrative resources. As for DK2020, direct exchange seems to have helped in collaborating with local businesses on the climate policies.

### 5.2.2 Enabling internal mobilization

Internal mobilization was named by several respondents (Frederikshavn, Skive, Høje-Taastrup, and Horsens) regarding DK2020. However, it seemed to play two different roles: one of convincing and one of coordination.

This first role of ‘convincing’ can be seen in municipalities where this climate agenda has used a means of overcoming a lack of legitimacy. To show, in Høje-Taastrup’s representative explained, *“now we have this DK2020 framework there is no discussion about it, because that is the framework, that is the rules, that is how we have to work if we want to be part of this.”* This need for internal mobilization was due to the fact that they do not have a broad organization like ProjectZero and they have limited personnel working in the climate area (e.g., **lack of human resources**). To compensate, they need to collaborate with other departments to implement certain projects. DK2020 provided them with the legitimacy and this sense of urgency required to take action now: *“being CO<sub>2</sub> neutral by 2050 is not the problem. But it is harder to convince the departments that we only have 10 years until 2030 so everyone has to think about it.”* (Høje-Taastrup rep).

The second role of coordination can be seen in municipalities where climate issues are dealt in a sectorial approach, and where the departments work in silos rather than together. For example, the climate manager in Skive explained: *“like in any large organization, sometimes the right hand does not know what the left hand is doing.”* DK2020 provides them with the opportunity to widen their gaze and help them realize that might be a lot of things they have not been working with but are actually climate relevant. A perfect example of this is the lack of coordination between climate mitigation activities and climate adaptation since they are often located in different departments. In such a case, the team looking at climate adaptation is not the same as the one for mitigation issues and they are probably not even within the same department. By using the CAPF, it helps them to investigate how they can make the two components work together and create synergies. To demonstrate, a climate manager explained that *“until we started working with DK2020, we had not been connecting climate adaptation to what we have been working with.”* (Frederikshavn rep). Additionally, this CAPF is a way for the staff to communicate with their mayors of the need for a coordinated approach between certain departments (within the municipality but also with other departmental units in other municipalities). This internal mobilization was not mentioned by Middelfart and Sønderborg as a beneficial function for their municipality. In Sønderborg, it has not something new for the climate manager who is already working with both climate mitigation and climate adaptation. In Middelfart, as it was part of their initial vision from 2008 to avoid climate work being done in silos, they already have this systematic embedding of the climate agenda and thus already had this internal mobilization. Ultimately, internal mobilization function is especially useful to convince and coordinate with other departments to overcome having a lack of human resources only working on the climate agenda.

For Energibyerne, they have not provided this function to their members yet. Besides the civil servants assisting to the meetings, the value it provides them doesn’t seem to have extended beyond that. For example, in Horsens, the climate manager explained that *“in that way, we see a value in participating in the network, but I am not sure that the leaders in this whole Technical and Environmental department, actually know what is going on and know how good it could be for them to assist.”*

### 5.2.3 Helping with GHG accounting

This function has been highly relevant for DK2020 since *“none of the other TMNs are requiring their members to have a Paris compliant climate action plan in place. There are no other networks, the ICLEI doesn’t do it, UCLG doesn’t do it, the local networks in Denmark doesn’t do it.”* (Realdania rep) A CAP that is ‘Paris compliant’ means that all GHG emissions (scope 1, 2 and 3) are considered in the emission baseline inventory. This rigorous and exhaustive process makes a major difference since *“by far, most of the CAPs in Denmark are incomplete in comparison to the [C40] CAP standard.”* (Realdania rep). This has been very important for many of the municipalities, and it can easily be seen in their CAPs. For example, Sønderborg, deemed to be one of the most ambitious municipalities, had not been monitoring all GHG emissions from agriculture and the open country. Thus, by using the C40 framework, it *“forces them to see if there are any gaps”* (C40 rep). Correspondingly, Skive’s climate manager also recognizes the importance of DK2020 which

“has gotten [them] back on track in terms of encompassing the right climate goals and not only focusing on CO<sub>2</sub> emissions and on renewable energy production.” This also leads to a better alignment with the national level emissions accounting which includes farming whereas most of the municipalities have never included it. In sum, this function helps overcome a **lack of scientific information and data management**.

#### 5.2.4 Formulating emission reduction goals

This function was only mentioned for DK2020 since Energibyerne does not require goal commitments from its members. As such, by asking to commit to certain objectives when joining the network, DK2020 sets benchmarks which makes the municipalities politically accountable for reaching them. For DK2020, the main commitment for the municipalities is to have a goal that is aligned with the Paris Agreement. All the four municipalities that have published their new CAPs have set their goal aligned with the Paris Agreement and the national goals of having a long-term goal of being net zero by 2050 as a geographical area and a medium-term goal of 70% reduction of CO<sub>2</sub> emissions by 2030 compared to 1990. In essence, this function is most valuable to increase the political support of the climate policies.

#### 5.2.5 Institutionalizing climate trajectories

Closely related to the previous function of committing to certain goals is the effect it subsequently has within the municipality. This function has been seen in two municipalities so far: in Frederikshavn, where “we have been hiring new people with a special focus on [adaptation].” This concrete effect is also discerned in Middelfart, where they have a newly employed person who was hired specifically for the implementation of the DK2020 agenda (klimalaboratoriet, n.a.). One of the goals of the mayor of Middelfart is to discuss their DK2020 membership and create action plans every three months for when the city council meets. Henceforth, this DK2020 function increases the local governing capacity of the municipalities since they now have more **human resources** to help implementing the climate policies. Moreover, the adoption of a climate strategy by the four pilot municipalities (Sønderborg, Frederikshavn, Høje-Taastrup, and Middelfart) along with the written commitment from the mayors from Horsens, Skive, and Ringkøbing-Skjern also indirectly shows this function. A requirement of DK2020 is that it has to be rooted in the highest political level. As a result, the actors within the municipalities seem very proud of the work they have done: “It is very well anchored into the into city council decisions and into the political system. And the politicians have strong ownership of the plans.” (Realdania rep). Thus, the DK2020 CAP mobilizes the **political actors** in the municipality.

#### 5.2.6 Advocacy and lobbying

The lobbying function involves the network being a ‘city advocate’ at higher administrative levels. This function has been highlighted for both networks as a means of overcoming barriers due to a lack of **legal competences**. Thus, the municipalities trying to overcome these challenges can come together through these two platforms to speak with a common voice to the national government.

On the one hand, Energibyerne is said to be “a coalition of smaller municipalities which gives them the possibility to have a common voice to issues that are not addressed in many other agendas. Often it is Copenhagen, it is Aarhus.” (Middelfart rep). This coalition of similar municipalities (in terms of size and the challenges they face) gives the network its strength through “equal partners” (Frederikshavn rep). Indeed, the chosen focus areas for joint projects reflect the main challenges faced by smaller Danish municipalities. The climate managers also assist together to the Folkemødet Festival which is a “very good meeting point for people with organizations and universities, from the political, from the regions and from Danish Parliament from all the municipalities.” (Tankegang rep). The mayors of each municipality also participate so it is a good way to engage them as well. On the other hand,

DK2020 is “*giving them the opportunity to use DK2020 as a project where they can speak with a voice together with the national government or to other organizations.*” (C40 rep). Since municipalities do not have the power to implement or write up laws, it can give them a way to push the national government to write up certain regulations. Additionally, it also offers them a platform to come together for using their purchasing powers as a source of economies of scale (**fewer financial resources**). For example, by coordinating the purchase of electric buses between a number of municipalities, the municipalities could get a lower price. This is dealt with the transport companies set up by the Regions. However, this function for DK2020 was not mentioned by the municipal representatives, and it is also not something that is yet in place but planned to be.

The difference between the networks is the means through which they communicate to the national government. In Energibyerne, it is through the “*use of each other’s networks to get into contact with the important people*” (Frederikshavn rep). On the contrary, DK2020 lifts stuff to the national level through the governance body of the network. DK2020 has “*gotten the attention of the minister of climate, Dan Jørgensen, who has approached DK2020 for seasonal meetings just to know what is going on.*” (Middelfart rep). Thus, it is the network representatives that are talking to the national level and not the municipalities directly. This could explain why it was not mentioned by the municipalities since the benefits are not always directly visible to the actors in the city. The main difference lies in if the network acts as an intermediary organization to discuss with the national level or if it offers them a voice to directly talk with them.

### 5.2.7 Offering project support and consultancy services

Moreover, the municipalities in Energibyerne are collaborating on three main focus areas for joint projects. These project collaborations are regarded as having a high potential for their climate work. Indeed, these joint projects offer a way to overcome a lack of action on the national level: “*the other civil servants always say ‘well, that’s not our business’ but if we go together, we can say ‘it is our business,’ we cannot just wait for the national level or EU level, we have to do something.*” (Høje-Taastrup rep). For each project, a chairman is responsible for preparing, advancing, and organizing the meetings of their focus area. For the Power-to-X project, PlanEnergi is the project chairman since he has the technical expertise to evaluate the potential for a Power-to-X project in each municipality. He is also the one who has been taking care of the whole application process for EUDP (Energy Technology Development Program) funding. This helps the municipalities since the evaluation for this type of project requires very **technical knowledge**.

### 5.2.8 Summary of the results

In conclusion, the most important functions of national municipal networks named by the climate managers are enabling direct exchange, internal mobilization, GHG accounting, and project support. There is a difference in two aspects with regards to network functions. Firstly, the seven climate managers have attributed a different importance to certain network functions which signifies a contrast in their perception of what is viewed as valuable. This contrast is because they have different reasons for becoming a network member and the intended benefit each network has. As such, the functions that are most valued by each climate manager depends on the difficulties they are trying to overcome on a local level. To explain, if a climate manager has some difficulties in coordinating the climate agenda with other departments, then by joining the network, the ‘enabling internal mobilization’ would be an important function for them. Such a function would not be as valued by a climate manager from another municipality if the climate agenda is embedded in other departments and the other civil servants are aligned with the overall climate vision.

Secondly, there is a difference between the functions considered useful for each network, as seen in Table 5-1. Furthermore, the only overlapping functions are ‘advocacy and lobbying’ and ‘enabling direct exchange.’ On the latter function, however, the group of actors with whom direct exchange is enabled with is different. Energibyerne enables direct exchanges with the other climate managers (i.e., externally), whereas DK2020 enables direct exchanges with local social actors such as businesses (i.e., internally). This truly highlights the difference between them and why the municipalities do not perceive the networks as competing between each other in their offerings but rather as offering complementary functions. This is surprising since the two networks share certain characteristics like i) they both have a hybrid governance structure by having public and private actors in their steering group; ii) the same geographical scope by being national Danish networks; and iii) a similar member base since they both focus on small and medium-sized Danish municipalities. However, the two networks have different goals and ambitions which have influenced what they offer to member cities. Indeed, DK2020 has more members (currently 66 municipalities) and a more heterogenous member base with municipalities with different capacities, ambitions, financial sources, and political commitments. This influences the different services they offer to their members. As opposed, Energibyerne has fewer members (7) that share a similar level of climate experience and level of ambition which the network can offer more tailored functions to. Additionally, the benefits induced by DK2020 seem to be ‘acquired’ from the beginning of the membership while for Energibyerne it took some time to build the benefits.

Table 5-1. Most important functions of the municipal networks

<b>Energibyerne</b>	<b>DK2020</b>
1) Enabling (external) direct exchange	1) Helping with GHG accounting
2) Offering project support	2) Enabling internal mobilization
3) Advocacy and lobbying	3) Enabling direct exchange
	4) Formulating emission reduction goals
	5) Institutionalizing climate trajectories
	6) Advocacy and lobbying
	7) Enabling (internal) direct exchange

Source: Own elaboration

### 5.3 Policy entrepreneurs

Within the context of this research, the notion of policy entrepreneurs is of central importance for both the municipal and network analysis. In the municipal analysis, the analytical framework had the dual focus on the structural factors influencing the governing capacity of the municipalities and on the agency-focused factors regarding how political and social actors influence the agenda and the role of local framing. From this, a recurring theme linking many of these aspects together was the role of the climate managers. Indeed, by engaging with the local actors, climate managers could steer their impact on the climate agenda by locally framing the climate policies. Additionally, policy entrepreneurs are interested in changing policies and how things are done, and this is seen in the mandate of the climate managers to initiate and guide the green transition within their municipality. In the network function analysis, the important role of climate managers was also underscored. By being the main actors representing the municipality, the climate managers are in a powerful position to steer the benefits gained from membership. Consequently, the climate managers of each of the studied municipality can be regarded as policy entrepreneurs. This is not to say that all climate managers are policy entrepreneurs automatically, but they can become policy entrepreneurs in the use of their municipality’s network membership to overcome local struggles.

As such, the goal of this Section is to review the previously presented results in relation to the theory of policy entrepreneurs. Five elements (social acuity, problem definition, team building, leading by example, and motivation and persistence) are used to analyze how the city network membership is employed by the policy entrepreneurs to advance environmental policy implementation. By doing so, it aims to answer the overarching research question:

- RQ1: How are small and medium-sized municipalities using national city networks to increase the implementation of local climate change policies?

### 5.3.1 Social acuity

Policy entrepreneurs must be equipped with a good sense of social situations in order to make use of windows of opportunity. This social acuity occurs in two ways. The first way policy entrepreneurs are showing social acuity is by understanding the ideas, motives, and concerns of others in their local policy context and responding effectively. This shows how to engage with the important **political and local actors** in the municipality. For example, Middelfart's policy entrepreneur explained their four Ks of climate communication: *klima* (climate), *konto* (account), *komfort* (comfort/welfare benefits), *klogskab* (wisdom). Depending on who he is talking to and their motives and concerns, he *“juggles around with this sort of argument depending on what you can smell, what you sense what the politicians are really occupied by and thereby sort of tone the different propositions you are making. (...) What I am doing is I am trying to be honest and open and giving people, the decision takers, the information they want.”* (Middelfart rep). So, if he is talking to economically oriented people, then he would highlight the benefits of climate work in an economic sense whereas if people are concerned with welfare possibilities, he will highlight the comfort aspects of the green transition.

The second way policy entrepreneurs demonstrate social acuity is through their good use of policy networks to find knowledge outside of their municipality. This is seen in Energibyerne with the function of **direct exchange** with the peers from different municipalities. For example, one interviewee said that *“For me, [Energibyerne], its core, is its knowledge. It is, in a way, a library.”* (ProjectZero rep). Additionally, the climate managers have used this network as a means of inspiring each other and getting feedback on how to best solve a problem. To show, Frederikshavn's representative explained how beneficial this network was: *“it is always good to have some friends to call and that is a really good thing with this network because we know that the other municipalities been working with this problem so they can help us solve it.”* Each of the climate managers have their area of knowledge expertise that they bring to the table and share their experience. This is very valuable for smaller municipalities who can have limited access to knowledge and reduces the number of **resources** each municipality has to put in because *“we do not need everybody to start with everything, we just need to build up and continue what others have done. So that we reach the goals as soon as possible.”* (Høje-Taastrup rep). By collaborating in this way, they do not need to all have the same knowledge but can turn towards each other for it. The networks can also inform climate managers about changing legislation which can either create a barrier to current climate action or create a window of opportunity. For example, *“if there is a new law, we have to know about it. So, it is knowledge and input [that is most valuable].”* (Sønderborg rep).

### 5.3.2 Problem definition

Problem definition relates to how a problem is presented to other individuals and the attributes that are highlighted as important. These influences what individuals give salience to and is closely related to the critical condition of **local framing**. This framing can either take a positive or negative turn. It also links back to why local governments are engaging in climate action. How the problem is framed depends on the type of actor you are talking to but also the individual's motives and beliefs. To show, climate action was mostly framed as a development

and business opportunity which aligns with the ‘green growth’ dialogue. This local framing was critical for the municipalities that struggled with a decreasing population. When talking with politicians, the policy entrepreneurs seemed to highlight co-benefits like community attractiveness, green job creation, and local industry.

For joining networks, some municipalities have opted for normative aims such as the status as an environmental leader. For example, the ProjectZero representative explained how the mayor of Sønderborg was pushed to become part of DK2020 by saying: *“of course we need to be part of this because this can become the new national network, the DK2020.”* This logic also reflects identifying future windows of opportunities in social acuity. This was also used in Høje-Taastrup where the mayor has recently expressed a stronger desire to become a leader. Thus, when it came to **formulating emission reduction goals**, *“we did not need to discuss the goal, because to be ambitious, we need to be at least at the same level as the national level.”* (Høje-Taastrup rep). Closely linked to this point, the threat of being considered a laggard was also a political motivation for engaging in certain city networks. This was used in Horsens where the participation in DK2020 was led more of a bottom-up process rather than a top-down process driven by political ambitions. The politicians were described as joining DK2020 because they had an obligation as politicians and were afraid of lagging behind.

### 5.3.3 Team building

Policy entrepreneurs are considered team players who work with others to promote policy change. Team-building activities can take three forms which will be analyzed below. The first form is to operate within a tight-knit team composed of individuals with similar ideas, policy beliefs, and value preferences. For Energibyerne, this tight-knit team between the policy entrepreneurs is present. The significance of being a small personal network of people that trust each other and share a common enthusiasm and desire to take climate actions was seen as an important condition for having this tight-knit group. Bringing together other policy entrepreneurs from other frontrunner municipalities was one of the motivating reasons for some of them to join the network: *“The reason why I thought it would be a good idea to work with this network is that not so many cities in Denmark have been working on a serious level with how we can solve the problem.”* (Frederikshavn rep). This frontrunner goal was actually part of the initial recruitment process where the initial idea from PlanEnergi’s representative was that *“they learn from other municipalities that are also ahead and maybe even more than from their neighbors. They also learn from their neighbors but if they can see the other frontrunners and what they are doing, then maybe they are more challenged and they will learn more.”* This common desire and enthusiasm were also a strong inhibitor since it took almost three years of more networking activities to get to the trust level they share now (time resource). When questioned about the future of the network, many have raised the point that they think it will continue because it has *“become part of a very personal network for all of us”* (ProjectZero rep). They have also grown to trust each other: *“You can say anything in the meeting, I think that trust level is very high. They listen to each other very much. And of course, they are different so cannot do the same and they are not doing the same thing, but they are exchanging a lot of experiences.”* (PlanEnergi rep). This reflects the mutual support this network provides them through **external direct exchanges** with the other climate managers. Being a small group was seen as crucial for the actors to be able to directly talk to each other.

The second form of team building is when the policy entrepreneurs build teams with parties that may not share the same policy beliefs but share an interest in realizing a particular sort of policy change. City networks have the potential of bringing together municipalities that are facing similar challenges and give them a common voice to talk to the national government in order to promote policy change. The importance of such coalitions is seen through the network function of **advocacy and lobbying** which was highlighted for both networks. Thus, when climate managers experience a challenge that is due to a lack of **legal competences** in a certain

area, they can use the networks to “*voice their challenges, draw inspiration and experiences from different cities, businesses, educational institutions and organizations*” (Minutes Energibyerne meeting, personal communication, 2021). Additional to teaming up with others from various municipalities, team-building activities were also seen when climate managers had coalitions through hybrid partnerships with the private sector within their municipality (**local actors**). Relying on such a strong team was key to success for many of them. When collaborating with private actors, the coalition may either share an interest in realizing a particular sort of policy change or they are simply dependent on each other for realizing their different objectives. The latter reflects the third form of team building. The DK2020 network facilitated the (**internal**) **direct exchange** with those local actors to initiate coalitions for the implementation of their climate policies.

A defining characteristic of policy entrepreneurs is that they are good at networking and making connections with other actors. To do so, they make use of their personal and professional networks and drawing from their political experience and contacts, and their professional reputation and expertise. This is seen in their use of opportunities for direct exchange with other actors such as conferences organized by the city networks. Networks like DK2020 and Energibyerne offer the policy entrepreneurs platforms to make more contacts, connect with other actors, and to deepen their already existing connections. This is seen in the three different forms of team building mentioned above. By expanding their network, it makes it easier to reach out to others when they are faced with a problem and gain from others’ knowledge and experience. Networks like Energibyerne use the networks of their members to connect with other actors and to offer **project support and consultancy services** to all the members.

#### 5.3.4 Leading by example

Leading by providing examples is a way that policy entrepreneurs can promote policy change in an effective way. Decision makers can be very risk averse, and it can create a lot of challenges for those seeking policy changes. To overcome such barriers, policy entrepreneurs have to communicate the workability of the policies. For example, in Middelfart the policy entrepreneur built this trust with politicians by showing them concrete results: “*It is learning by doing and showing good results. We are back to initial thinking of making concrete results, showing them and enlarging and getting more and more into the everyday working life in our municipality.*” (Middelfart rep). In Frederikshavn, this element has also been present when trying to tackle consumption amongst the local population. To show, the Youth Climate Council that has been set up uses a leading by example approach. They have organized a pop-up restaurant where they showed the visitors how to make climate-friendly food and secondhand clothes sale for people to sell and borrow clothes. While it is not actually the climate manager that is ‘leading by example’, he enabled the youth to do it. This is thus linked to the other policy entrepreneur element of building teams.

Furthermore, another way for policy entrepreneurs to show the workability of the suggested policies and reduce the perceived risk is through participation in city networks. Indeed, network membership has been used as a tool for cities to legitimize climate policies and to draw attention to problems related to urban climate governance. For example, in Horsens municipality, being part of DK2020 seemed to help with **institutionalizing climate trajectories** and mobilize politicians by pointing towards the proliferation of municipalities joining this climate network for them to be part of it. This was also used in Høje-Taastrup as a means of **internally mobilizing** other civil servants into putting climate change on their agenda as well. Additionally, Frederikshavn’s Youth Climate Council was presented in the Youth Climate Declaration festival organized in Sønderborg which inspired the representative from Høje-Taastrup to also set it up in their municipality. This was a result of the **direct exchange** between the two climate managers in the context of the city network.

### 5.3.5 Motivation and persistence

Motivation and persistence are two elements that have been raised in the literature as important characteristics of policy entrepreneurs. The motivation from the policy entrepreneurs emerged from several city network functions.

The regular and **direct exchange** with others from different municipalities in Energibyerne was seen as beneficial “*to meet and talk to others with the same enthusiasm*” (Ringkøbing-Skjern rep) because “*not so many cities in Denmark have been working on a serious level with how we can solve the problem.*” (Frederikshavn rep). This level of seriousness often came up when the representatives shared what commonalities they have between themselves. All the municipalities have mentioned that Energibyerne has been fruitful for them regarding getting inspiration from the others and sharing knowledge “*we went into the meetings because they [the other municipality representatives] know so much and it is very good to hear what is going on in other municipalities and we take this inspiration and when we bring it home. (...) It is a big inspiration*” (Horsens rep). This shows the value the representatives see in these exchanges between the municipalities and how it motivates them to take action. The policy entrepreneurs do not only seem to gain motivational effects from **direct exchanges** with peers from networks but more generally from networking and collaborating with like-minded souls. This was best shown by Ringkøbing-Skjern’s representative who explained that “*working together with the citizens and the companies, that is what makes me full of energy. Yeah, that is the eternal energy of renewable energy. Together with the people from Energibyerne.*” Moreover, direct exchange also seemed to provide them with motivational benefits. For example, in Frederikshavn they apparently had the same secretary for many years and were looking forward to the Energibyerne meetings since “*they also had a lot of nice results in the last couple of years that they could present during the last meeting. It is also part of it to be proud of what you did and to show it.*” (PlanEnergi rep). Thus, motivation can also be gotten from presenting your work and getting some praise, more so when this is maybe not so present internally.

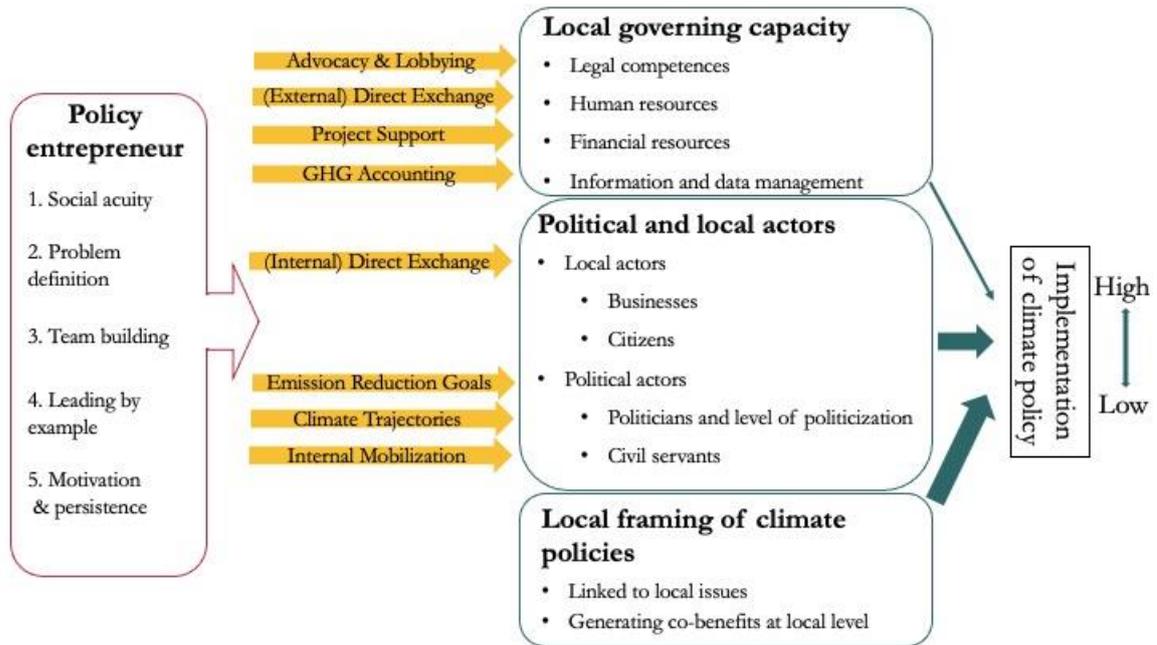
Furthermore, the seven policy entrepreneurs are driven by altruistic and idealistic motives. To illustrate, Middelfart’s representative explained that “*My personal motivation well, I want to save the world, and this is a good place to do it. I mean I could probably double my salary by going somewhere else, but I would not have the possibility to make the projects I really enjoy.*” A strong indicator is that many of them have started working on climate change issues a long time ago, before it became more of a mainstream issue. This also reflects the persistence element of policy entrepreneurs who are often the individuals in municipalities that have been working on climate issues for many years. To show, the representative from Frederikshavn was explaining that “*it is good to be there for many years because now we can see the results of our past efforts to create jobs in the future.*”

### 5.3.6 Concluding remarks

All the seven municipalities have pointed towards each other as pioneers with a long track record. The performance of these municipalities on climate issues is often due to the activities of a few individuals within the municipality. Even if there was strong leadership from the mayor, there has been a turnover in these while the constant remains these dedicated civil servants. Thus, it is these individuals who are the climate managers in the municipalities who have been leading and working on the climate agenda ever since the municipality started working with this. The impact of city networks on local climate governance can be seen in Figure 5-1 below. The analytical framework for local climate governance was adapted a bit to offer a better visualization of this impact. It is the climate managers that are creating the impact which is reflected in the different elements of policy entrepreneurs. For the element of social acuity, it was found that the policy entrepreneurs developed policy networks by means of direct exchange with other policy entrepreneurs. Problem definition was also shown in the local framing of climate policies and the use of the function of internal mobilization. Team building was

extensively used within the municipal organization with other civil servants, within the municipality by way of collaborations with citizens and businesses and horizontally by collaborating with other municipalities. Moreover, leading by example was used in consumption related climate policies and by use of the networks. Finally, motivation and persistence was through the external direct exchanges with other climate managers as engaging with similar minded individuals provided them with a motivational boost.

Figure 5-1. Impact of city networks on local climate governance



Source: Own elaboration

## 6 Discussion

This Chapter discusses the significance of this thesis's results (Section 6.1) by first looking at the municipal level, then the network level, and finally the important role of policy entrepreneurs into linking these two levels together. For each of these, the main results will be recapitulated, and certain aspects were chosen to go more in depth. The outcomes of this thesis's analysis will be compared with the works of other studies and provide an assessment of this work's contribution to existing knowledge. Lastly, theoretical and methodological limitations of this study will be presented in Section 6.2.

### 6.1 Significance and relevance of the results

#### 6.1.1 Local climate governance

Within this study, the key factors having a critical effect on climate policy implementation were the two political actors of policy entrepreneurs and politicians, along with the local framing of climate issues. This aligns with Ryan's (2015) findings since these two conditions are deemed critical, while the local governing capacity was a necessary condition to take climate actions but not a sufficient factor. Thus, it is confirmed that the framework indicated what would happen regarding the fact that the three sets of conditions do not have equal causal effect on climate policy. This is an important contribution since it does not seem that this analytical framework has previously been applied in other studies. In like manner, this thesis has also proven that this framework, which was based on large cities in Latin America, is applicable to smaller municipalities in Denmark as well.

The configurational approach of the framework permitted to avoid the long lists of factors that could potentially affect climate policy implementation and instead allowed the researcher to identify and analyze combinations of conditions that most affect it. It also showed the importance of such an approach since factors and conditions may lead to different ways of shaping the outcome and that the effect of one factor may depend on the presence or absence of category other conditions. This thesis authenticates Ryan's first conclusion on the causal relevance of factors regarding the relative importance of capacity. Indeed, it seems that 'legal competences' and 'information and data management' resources depend on higher levels of government such as the State while 'human resources' and 'financial resources' could be influenced by local governments. This was seen that the presence of political support influenced the governing capacity, especially for the 'human resources' and 'financial resources.' In other words, when politicians supported the climate policies, more resources were being allocated to the climate team. This confirmed Ryan's (2015) second conclusion of the causal relevance of factors that stated that governing capacity was a necessary condition for implementation to occur, but it does not explain what motivates political actors to support or oppose it. This was well represented in the case of Horsens, the largest municipality analyzed, which had a high capacity to implement, but not the political support which lowered the implementation of the climate agenda. Likewise, political support was also higher when a policy entrepreneur was there to push and shape the climate agenda. This shaping is linked to the other important condition of 'local framing' which helped gain support from all the other political and local actors such as the businesses, citizens, and politicians. In Ryan's original framework, policy entrepreneurs were considered as a separate actor in the political and local actor factor, but it was initially removed for this thesis's analysis since it was a separate framework. Thus, it confirmed the importance of having such an actor, but that local framing is one of the main characteristics of these actors so that maybe it should be a separate factor altogether. The importance of local framing confirms the third conclusion elaborated by Ryan where when a municipal climate policy is linked to local concerns, it led to a higher acceptance of the agenda and allowed it to sustain through a change in political parties.

### **Local governing capacity**

Many authors have highlighted the importance of population size on climate action with the argument that the bigger the municipality is, the more resources it has, which thereby defines the climate action it can take. This reflects the fact that bigger cities have more governing capacity to implement climate actions than smaller ones since, due to their smaller size, they have fewer resources like human resources and financial means (Bedsworth & Hanak, 2013; Hoppe et al., 2016). Within the analyzed municipalities, it seemed that if climate change is a priority for the city council, the civil servants working on this will be given more autonomy, a larger scope, and their mandate will thereby reflect this vision. While no generalizable conclusions can be drawn, it could be due to the higher self-governing powers given to Danish municipalities. This was also pointed out by Van der Heijden's (2019) literature review which pointed towards the importance of autonomy for taking local decisions and a supportive political context. Regardless, it seemed that high political alignment with the climate agenda was sufficient to help overcome capacity barriers.

### **Political and local actors**

Political and local actors as a critical factor involved businesses, citizens, politicians, and civil servants. Local actors critically influence whether and how a policy option is going to be implemented (Moser & Ekstrom, 2010). Collaborations with businesses and public-private partnerships create opportunities for actors to access resources and capacities they would not have had by themselves (Westman & Broto, 2018). Thus, it helps overcome action barriers like limited knowledge, technical capacity, and financial resources and reflects this trend towards the externalization by sharing responsibilities on climate strategy development and its practical implementation (den Exter et al., 2015).

As for citizens in the studied municipalities, they seemed to only be involved after the climate policy planning phase when all the decisions are already made, and the municipality just needs their approval to start implementing. This limits the citizens' options to either accept or resist the situation. A similar finding was uncovered in another study of Danish municipalities where it there was little public involvement and when the public was included, it was through one-way communication from the municipalities to the citizens (Lund et al., 2012). As opposed, in Salon et al.'s (2014) study in Californian cities, the residents' direct motivating influence appeared to be more important in smaller cities than larger ones. Residents can push local policy both towards and away from climate actions. In this thesis, citizens have mostly been pushing away from climate action. This has been with regards to putting up wind turbines in the municipalities in Jutland and for district heating in Horsens, specifically. This differs from the finding of Hoppe et al. (2016) who, in their study of four small-to medium-sized cities in the Netherlands, found that multiple community actors like citizens drove climate action.

The influential role of the level of support from politicians on the resources being allocated was also highlighted by Fenton (2014) in his delineation of the five factors to understand the capacity of municipal organizations. He explained that the individual and collective will of the organization and stakeholders had a strong impact on both the mandate to act and the scope of their processes. This also links to the position of the climate managers in the organization (Planning or Business Development department). A number of municipalities have chosen, like most other local authorities to establish climate change units or to have one full-time official implementing the CAP (Bulkeley, 2010; Kern & Alber, 2009; Wejs, 2014), which is said to help anchor the climate agenda in the municipal organization (den Exter et al., 2015). The importance of other civil servants as political actors to mobilize was also identified by Burch (2010b) in her study on transforming barriers into action in three Canadian cities. In fact, the anchoring of climate strategies in practical implementation is said to require the internal support from employees to make it a success (den Exter et al., 2015). It was also said in der Exter et al.'s

(2015) study that “*internal support from other civil servants may be more important for performance than formal power*” (p. 1071).

### **Local framing**

The strategy of linking climate issues to more pressing local issues has been stressed by Bai (2007) as a way of integrating global environmental problems into the local agenda and overcoming politicians’ discourses of ‘not on my turf’ as the problems are perceived to be beyond their municipal boundaries, and that they are viewed as ‘not my business.’

#### *Climate mitigation*

Many of the studied municipalities have used this technique by linking the local climate strategy to the pressing issue of local development. Climate change was framed not only as a threat but as an opportunity by developing the idea of ‘green economy,’ which aims at generating green jobs while reducing GHG emissions. Similar results were found by Wejs (2014) who compared the approach of eight Danish municipalities for climate change integration, amongst these were Skive and Sønderborg. The author found similar results to this thesis where local development is the central motivation of the two municipalities to overcome economic challenges. Moreover, a similar framing was also used in two cities characterized by Wurzel, Moulton et al. (2019) as ‘structurally disadvantaged cities’ due to the fact they suffered serious resource constraints, had high unemployment rates and shrinking populations. Because of such a growth opportunity framing, the cities were said to show cognitive leadership and entrepreneurial leadership by building extensive networks and climate alliances within the city (Wurzel, Moulton, et al., 2019). Since the municipalities have high self-governing powers, it has allowed them to customize their mitigation activities in such a way. Indeed, the strategy of linking climate issues to more pressing local issues requires the presence of a local issue which can be used as a base to address climate change (Bai, 2007; Damsø et al., 2016). Whereas co-benefits and green growth have previously been described as important drivers for action in bigger cities in both developed and in developing countries (Corburn, 2009; OECD, 2015; Puppim de Oliveira, 2013; Romero Lankao, 2007), the informants of this study unsurprisingly revealed that the reframing of global issues into a local one is as important in smaller cities and towns and perhaps even more relevant for those with a shrinking population.

In short, while growth has led to the higher acceptance and implementation of the climate agenda in the studied municipalities, it should not always be something that cities should strive for since growth dialogues are not always socially just and environmentally sustainable (Xue, 2021). Reducing emission is becoming more connected to consumption, sustainability and justice (Bulkeley, 2021). The next steps required to reducing emissions is to also reduce consumption and change consumption patterns which might clash with ideas of green growth. Linking climate change to consumption is central to the degrowth thinking of “*living within ecological limits by reducing production and consumption levels, and meanwhile striving for well-being for all and enhancing justice and democracy.*” (Xue, 2021, p. 1).

#### *Climate adaptation*

While it was decided to include both climate mitigation and climate adaptation in this thesis, the results have mostly shown a focus on climate mitigation on the part of the municipalities. This was strongly influenced by the positions and task the interviewees had and the fact that Energibyerne is essentially focusing on energy-related topics. However, this reflects the general more widespread focus on mitigation, while adaptation is not attributed the same importance. This aligns with previous studies (Busch, 2016; Hoppe et al., 2016). Indeed, mitigation has been the leading approach in addressing climate change with the view that it is better to prevent GHGs emissions rather than having a more ‘Band-Aid’ approach (Grafakos et al., 2019). A

similar approach was found by Campos et al. (2017) for Portuguese municipalities where the authors stated that “*lack of knowledge and information, lack of access to funding sources and the nature of mitigation versus adaptation actions may explain also why adaptation weighs less than mitigation.*” (p.76). In the Danish context, it also seems that the lack of knowledge on climate adaptation as a broader topic than a water issue plays a part in the lower level of awareness. Due to this perspective, adaptation is located within other non-climate departments and there is a lack of coordination between the climate and water departments. This finding was also identified by Lund et al. (2012) for other Danish municipalities. Additionally, as explained in the Danish background Section (4.1.1), there is no governmental body responsible for coordinating climate adaptation actions between municipalities, which creates an institutional void. Thus, municipalities lack guidance from the national level in terms of the municipal roles on climate adaptation (Amundsen et al., 2010). As a consequence, most municipalities’ engagement with adaptation would fall under the category of ‘not my turf,’ treating it as something beyond their duties which should be coordinated by higher levels of authority (Bai, 2007). Nevertheless, some municipalities have started to engage with climate adaptation due to a higher perceived risk and vulnerability, which resonates with the recommendation of Dupuis and Knoepfel (2013) to frame in terms of vulnerability centered adaptation. Framing has also been deemed critical for climate adaptation since it influences who is allocated responsibility for taking action which is relevant since many climate adaptation measures requires the engagement of citizens, more so than climate mitigation activities (Wolf & Moser, 2011).

### **6.1.2 Network climate governance**

The most important functions of national municipal networks named by the climate managers are enabling direct exchange, internal mobilization, and GHG accounting. The first two align with the findings offered by Busch et al. (2018) where internal mobilization was ranked as the most important while enabling direct exchange was mentioned less frequently by the respondents. Enabling direct exchange, internal mobilization, and GHG accounting will be discussed more in depth along with some other less frequently mentioned functions. Then the linking between the two analyzed networks will be discussed.

One of the research gaps this thesis sought to focus on was the lack of focus on national municipal networks due to an over focus on TMNs. While the aim was not to compare both forms of networks, it is interesting to reflect upon. The importance of geographical scope seems to matter more for certain functions. Busch (2016) explained that the three functions of internal mobilization, formulating emission reduction goals, and climate trajectories do not require direct interactions with the networks, while the functions of direct exchange and project support do require direct interaction with the networks. It seems that for the two functions Busch (2016) pointed out as needing to interact with the network also involves the interaction between the members. Indeed, it seems that direct exchange benefits from a national outlook.

#### ***Enabling direct exchange***

The most important function mentioned by the climate managers for both national networks was the ‘enabling of direct exchange’. Busch et al. (2018) claimed that direct exchange manifests in three ways: direct exchange of ideas, networking to initiate regional cooperation, and as a motivational boost. In the first way, Busch (2016) claims that the learning process behind best practices does not come from looking at newsletters or homepages of TMNs but occurs through direct exchange between the climate managers when they can engage in intercity dialogues during study visits, network conferences, and informal discussions (Busch, 2016). In other words, two-way communication is required for a learning process to occur. In a similar vein, Boulanger and Nagorny-Koring (2018) conducted the evaluation of the replication approach of best practices in several projects within the H2020 SCC where they found that there were

significant barriers to replication and no actual empirical evidence of it taking place. Stead and Pojani (2018) also second the limits of best practices: “*research findings suggest only a very modest impact (at the most) of best practices on policy change.*” (p. 4). The second way direct exchange is said to manifest itself through networking to initiate regional cooperation did not appear in this thesis since both networks are already more localized than the TMNs analyzed by Busch et al. (2018). Furthermore, the networking to initiate regional cooperation did not appear since, in Energibyerne, this cooperation was created based on the networking done at Folkemødet Festival. For DK2020, it is still at an early stage and the current exchanges are based online due to the current pandemic which limits the possibilities for actual direct interaction.

Moreover, these findings align with what is found in literature, especially those on city-to-city learning (Haupt et al., 2020). Haupt et al.’s (2020) research similarly aimed at understanding the relationship between TMN and local climate governance. The most given responses to the perceived added value of a TMN membership were: i) providing a platform for knowledge sharing and learning, ii) sharing best practices gives credibility about innovative approaches, and iii) getting inspiration from best practices implemented by frontrunners. From this, the first and third added values are coherent with this thesis’s results and reflect the value in exchanging with other peers. However, for Haupt et al.’s (2020) respondents referred to colleagues abroad and a different perspective than their own national one, even if cities from the same country were pointed out as particularly valuable, while for Energibyerne and DK2020 it was on a local basis. Furthermore, Karhinen et al. (2021) did a qualitative assessment of the factors of the Finnish based Hinku network membership that interviewees regarded as being the most effective in enhancing the climate work in the municipalities. Some of these results are quite like the ones found in this thesis regarding: structuring climate work (i.e., internal mobilization), providing expert support (i.e., project support and consultancy services), offering peer support (i.e., enabling direct exchange), concrete measures triggered, forerunner status experience, and legitimizing local climate work (i.e., institutionalizing climate trajectories). As opposed, the values of concrete measures triggered, and forerunner status experience was not mentioned by this thesis’s interviewees for neither network.

On another note, three main conditions seemed to have been crucial to facilitate this direct exchange between the climate managers in Energibyerne. Firstly, the municipalities share the same language, boundary conditions, country, challenges, and same traditions on a broader level, and similar level of experience in local climate action (**similar context**), reflecting the advantages of national networks enumerated by Lee and Jung (2018). This finding also aligns with Woodruff’s (2018) findings for adaptation networks where local governments learn more from cities in the same region as them. He also found that global cities may share more with one another than neighboring jurisdictions. This first condition seems to reflect more the explanatory factors used by Busch et al. (2018) to differentiate between best practices and direct exchange (face-to-face interactions and similar geography, legal competences, funding schemes, and regulations). While this can help the exchange and reduce transaction costs of collaborating, it is not enough to explain why some collaborations between some actors work and some do not. Indeed, by focusing on the agency, one can see that it is the personal relations and direct exchanges between the actors are crucial for building trust. This was mentioned by many climate managers, and it was only possible due to being a small intimate group. These findings confirm what Haupt et al. (2020) said: “*social and personal skills of the involved stakeholders will determine the success and evolution of city-to-city learning.*” (p. 156). It also reflects the important role of the climate managers acting as policy entrepreneurs since it is their networking skills and team building capacities that can enable the benefits.

Secondly, the significance of being a **small personal network** of people that trust each other and shared a common enthusiasm and desire to take climate actions. Being a small group was

seen as crucial for the actors to be able to talk to each other. The common desire and enthusiasm were also a strong inhibitor since it took almost three years of more networking activities to get to the trust level they share now (time resource). Being a small group of maximum 20 people was recommended for the mentoring approach to take place as an alternative to replication by Boulanger and Nagorny-Koring (2018). This was also seen as necessary to have more than just networking meetings and to make it possible to “*unveil the hidden challenges behind best practice success stories.*” (Nagorny-Koring & Boulanger, 2018, p. 324). Additionally, it is also mentioned by Loorbach (2010) for transition to take place with “*small network of frontrunners with different backgrounds (...) [with] not too many actors (10-15)*” (p. 173).

Lastly, the two people from ProjectZero acting as **neutral coordinators and mediators** of the inter-municipal exchanges were necessary to structure and coordinate the quarterly meetings. They organized the different field visits during which the actors could learn about each other’s successes but also weaknesses and challenges. Funding was also provided for the travel expenses of the field visits. This was also the second crucial aspect for the mentoring approach recommended by Boulanger and Nagorny-Koring (2018). These actors could be seen as acting as ‘transition intermediaries’ since they link actors and activities, connect visions and demands of actors within existing regimes, as explained by Kivimaa et al. (2020).

The two first conditions seem to reflect some of the dimensions of proximity brought forward by Boschma (2005). The five dimensions of proximity are: geographical, organizational, institutional, social, and cognitive proximity. The geographical and institutional/cultural proximity seem to reflect the first condition mentioned here while social proximity reflects more the second one since this proximity involves “*the socially embedded relations between agents at the micro-level.*” (p. 66). Boschma (2005) explained that the importance of geographical proximity is either a sufficient or necessary condition for learning to take place but it nevertheless facilitates interactive learning. While proximity is good for creating interactive learning environments, a balance between ‘too little’ and ‘too much’ proximity needs to be drawn (Ben Letaifa & Rabeau, 2013).

### **Internal mobilization**

Internal mobilization was one of the functions detected with the help of adopting an agency approach to the most useful functions of city networks. This function had not been previously flagged as being important from other theoretical frameworks that described the impacts of city networks since they remain on a more abstract level (Andonova et al., 2009; Bulkeley et al., 2003; Busch, 2015). However, it was identified as the most important function from Busch et al. (2018) who also adopted an agency approach to the impact of networks. This function was also quite useful on a local climate governance level because it showed the importance for climate managers pushing the climate agenda of mobilizing other actors within the municipal organization, something that was missed in Ryan’s (2015) framework. This function also influences the mobilization of crucial actors that play a bigger role in the development and implementation of climate policies. Moreover, networks like DK2020 who demands the cities to show that they have allocated hours and personnel for an internal steering committee helps enhance this internal capacity. It is said that having such a committee can ensure tasks are well divided and anchored within the administration and organization (den Exter et al., 2015).

### **GHG accounting**

GHG accounting was mentioned less frequently as important function in Busch et al.’s (2018) and therefore it differs from this study’s results where it has played an important role. Moreover, the authors identified ‘enabling GHG accounting’ as being most relevant for ‘laggards’ municipalities. Conversely, many of the municipalities in this study could easily be perceived as frontrunners, especially in the energy sector. A potential explanation is that the climate policies

have been framed according to the local issues where a large source of emissions was associated to CO<sub>2</sub> sources such as energy systems and transportation. Since many of the municipalities coupled climate change with their local issues (unemployment, shrinking population), this local framing led to a ‘narrower’ focus of emissions. This was also combined with the lack of legal competence and available technology to reduce GHG emissions arising from agriculture and land use. Additionally, the CAPF provided by C40 seems to be the first plan that is aligned with the Paris Agreement which could explain why it is not typically mentioned for other networks

### **Other functions**

While all 11 of the initial functions identified by Busch et al. (2018) were used in this thesis, the results of this master thesis reflected the same initial five functions as being most important. The function of ‘Advocacy and lobbying’ was also highlighted in this study and it is often stressed by both networks and academia as being a significant aspect since TMNs often lobby for cities on higher levels of governance (e.g., Andonova et al., 2009). In contrast, it did not show in Busch et al.’s (2018) survey results and this was explained by the difference in levels of analysis since they focused on the perceived impacts by the municipal staff and the results from lobbying efforts are harder to attribute to the actions of the networks. Correspondingly, a similar explanation is found as to why it rendered to be influential in this thesis. Indeed, the climate managers are the ones representing the Energibyerne network when lobbying at the national level. Thus, there is not this intermediary body representing the municipalities since they are representing themselves. This is also easier to engage directly with national governments rather than on global level. As opposed, Karhinen et al. (2021) did not mention it for the Hinku Finnish network.

Some of the functions were, however, mentioned by the DK2020 network representatives such as providing ‘Access to funding’ during the development of GHG accounts and baseline scenarios for the municipalities. This is an important offering from DK2020 because city networks do not typically provide funding themselves but provide access to funding by other entities. However, this was mentioned by none of the municipalities. This could be explained by the fact that it was not offered to the municipalities in the pilot project and for those in the first call, it is the three municipalities part of Central Denmark Region who have coordinated the development of GHG accounting aligned with the Paris Agreement by means of hiring PlanEnergi. Furthermore, other functions were mentioned by the DK2020 network representatives but have not yet been put in place yet, which also explains why they were not mentioned.

### **6.1.3 Policy entrepreneurs**

Policy entrepreneurs were found as the link between actions at the municipal level and at the network level since it was the doings of the climate managers pushing for actions locally and participating in networks that made a difference. The four elements of policy entrepreneurs presented by Mintrom and Norman (2009) were found in the municipalities analyzed in both local climate governance and network governance which will be briefly discussed in the following paragraphs.

#### **Local climate governance**

From the local level, the analytical framework used combined both the structural factors and the more agency focused factors influencing the agenda. From the agency perspective, the importance and the different elements of policy entrepreneurs could also be identified. As explained by Salon et al. (2014) “*successful local climate action requires local climate policy entrepreneurs who understand their community well enough to choose and frame their policy proposals so that they will be locally attractive.*” (p. 77). This was also found in Homsy’s (2018) study of the drivers of climate

mitigation action in smaller American cities. The researcher found that local entrepreneurs reframed climate change drivers in two ways: climate actions as being fiscally sound, and climate actions to push for economic development and to rebrand the community or stand out from other municipalities. When considering the structural factors, this thesis uncovered that while all the climate managers are policy entrepreneurs (or have the potential to be), not all of them were able to take actions leading to policy changes. Indeed, policy entrepreneurs are constrained by their specific policy contexts. This interaction is most often found in literature on new institutionalism where the interplay between structure and agency of actors is of high interest. Mallet and Cherniak's (2018) study on a subnational jurisdiction in the Canadian Arctic showed that institutional factors deserve attention in the analysis of policy entrepreneurs and the strategies used since they shape the conditions in which the activities are undertaken by the entrepreneurs. Mintrom and Norman (2009) called for the need for more studies on the interactions and how contextual factors serve to constrain and shape the actions of policy entrepreneurs. This thesis provided some valuable insights by using systematic case studies to generate important insights on this interaction. Moreover, many of the elements of policy entrepreneurs were also reflected on the local governance level with the problem definition through local framing of climate policies and team building with local actors, which were the two most present elements. These strategies of team building, networking/social acuity, and framing (making sure problems get interpreted in a certain way) were also found in Huitema and Meijerink's (2010) study of 16 major water policy changes across the globe in which policy entrepreneurs were consistently involved in.

### **Network governance**

The focus of this analysis has been on how municipal network membership can be used as a tool to assist policy entrepreneurs with these four elements. In line with Busch (2016), even if mayors are the signatories to networks like DK2020, the actual interest in and impacts of member cities work are defined by local climate managers. Adding to his finding, the results of this thesis showed that climate managers do make direct use of network membership for their own work in implementing the local climate agenda and that interest in city network is shaped and defined by local climate managers.

One of the research gaps this thesis pointed out was the fact that some authors by using only the framework of MLG as valid analytical tool, it treats cities as internally homogenous actors with a coherent agenda and it has some important omissions regarding the limited attention to the multiple forms of agency (Bulkeley, 2021). By doing so, the actions of individual actors and the internal dynamics with a municipality are not being accounted for. This is clear when comparing the results with those of Gustavsson et al. (2009) who looked at two Swedish cities participating in city networks from an MLG perspective. Their results showed how, due to their geographical positions, the cities use networks differently and the authors concluded that the different geographies had a significant influence on both their level of ambition and the local climate policy profile. Gustavsson et al. (2019) only briefly mentioned that local geography does not automatically lead to climate policy and actions and that committed individuals play a significant role in the initiation and promotion of climate issues and in the networking activities. However, this thesis explored more in depth the role of these committed individuals as prime actors at the municipal level and in network participation and that they are more important factors than geography and physical context. This is linked to the fact that it is the policy entrepreneurs that frame local climate policies to the local geography and context not just the geographical position that makes cities act and use networks in different ways.

On another note, many of the policy entrepreneur elements reflected in the use of network functions. Since it was the novel approach of Busch (2016) to apply the elements of policy entrepreneurs brought forward by Mintrom and Norman, the results of this study will be

compared with his and differences will be highlighted (visual in Table 6-1.). For social acuity, both had direct exchange, but Busch also had project support and consultancy services. However, the technical expertise of the consultants was not highlighted for Energibyerne nor DK2020. A potential explanation is that five of the municipalities out of seven have been using the services and knowledge from PlanEnergi and Tankegang before Energibyerne started. For DK2020, it was not mentioned probably because many of the representatives were not the ones having to do the actual writing out of the CAP and thus were not the ones in contact with the network. Moreover, the functions identified by Busch for the team building element were found in the leading by example element. This shows the overlap with building coalitions with other actors (team building) and using these other actors to convince their local decision makers to join a network (leading by example). It also indicates that climate managers use networks differently depending on their local needs.

Figure 6-1. Comparison of network functions used by policy entrepreneurs

Policy entrepreneur elements	Function of TMCN identified by Busch (2016)	Functions of city networks identified in this study
Social acuity	Direct exchange Project support	Direct exchange
Problem definition	Internal mobilization	Emission reduction goals
Team building	Institutionalizing climate trajectories Direct exchange Internal mobilization	Project support Advocacy and lobbying Direct exchange
Leading by example	Direct exchange	Institutionalizing climate trajectories Direct exchange Internal mobilization
Motivation & persistence	Direct exchange	Direct exchange

Source: Own elaboration, information from Busch (2016)

Furthermore, the seven policy entrepreneurs in this study were found to be driven and motivated by altruistic and idealistic motives. Thus, this confirms with the findings of Busch (2016) and counters the expectations of Mintrom and Norman (2009) that policy entrepreneurs are driven by their self-interests. This may be true for general policy entrepreneurs, but it does not seem to apply for environmental policy entrepreneurs. A strong indicator is that many of them have started working on climate change issues a long time ago, before it became more of a mainstream issue. This also reflects the persistence element of policy entrepreneurs who are often the individuals in municipalities that have been working on climate issues for many years. On a local level, one aspect identified by Homsey (2018) of local leadership for climate managers in smaller American cities was their personal motivation for driving climate actions. However, their enthusiasm does not give them a free hand for actions and local actions have to be sold to elected officials through the reframing of the climate problem. On a network level, the direct exchanges between the climate managers were the most important function that provided them with a motivational boost and inspiration. Like Busch's findings, the exchanges with others give them the feeling of being part of a movement and part of a group of dedicated individuals working towards the same goal and fighting the same battles in their respective cities.

## 6.2 Reflections on methodological and theoretical choices

In this Section, reflections regarding the choice and methods and theories will be addressed. Some recommendations as to the future use of the frameworks were also added.

### 6.2.1 Theoretical choices

The three theories and analytical frameworks used in this thesis could have affected how the results were interpreted. The first analytical framework of Ryan (2015) provided a useful

configurational approach. However, there was some overlap between the categories of the relevant political actors and the local framing one since the local framing was often done in relation to the most important political actor. Moreover, the paper lacked some consistency in the use of terms between what was first introduced, what was discussed and what was found in the visual framework (e.g., political actors vs. social actors, organizational resources vs. administrative resources). This hindered the systematic approach it aimed to offer researchers. To overcome this, the description of the framework in Section 2.4.1 of this paper presented clear definitions of each concept used. Additionally, a suggested complement to the framework would be to include the people working within the municipality for the ‘political and local actors’ category. The importance of other civil servants was shown in the use of membership in city networks as a way of enabling internal mobilization of all actors within the municipality. The business actor factor identified by Ryan (2015) should be expanded to include a broader range of stakeholders like universities, utility companies and NGOs rather than only focusing on private businesses.

The second analytical framework brought forward by Busch (2016) was useful to analyze the different functions of city networks. This framework resulted in showing that the direct exchange between the climate managers as being the most important function. The exchange of knowledge has been the most important benefit highlighted in literature. However, a potential limitation of this framework is that relative importance of direct exchange. While the authors argued the difference between other functions that could have been combined such as ‘internal mobilization’ and ‘institutionalizing climate trajectories’; ‘project support and consultancy services’ and ‘access to funding’, a similar argument was not provided for direct exchanges even though it was characterized in three different ways by these authors. This could have influenced in the same way the importance of direct exchange even though in this thesis it was expanded to distinguish between the internal direct exchanges with stakeholders within the municipality and external direct exchanges between climate managers from different municipalities. A potential alternative that could have been used was from the literature on collaborative governance where authors like Ansell and Torfing (2015) provided a more elaborate continuum of collaboration. While this thesis took a more network governance and agency focused approach, other perspectives could have been used. For example, many aspects from the function of enabling direct exchange were also found in transition management scholars and in policy network theories. Indeed, the conditions mentioned to foster direct exchange reflects many aspects of the transition arena mentioned by Loorbach (2010). Likewise, networks could also have been analyzed through the literature on intermediaries used to advance transitions. This could have better reflected the use of the theory on policy entrepreneurs.

Lastly, the framework provided by Mintrom and Norman (2009) for analyzing the different elements of policy entrepreneurs was useful since most literature in urban climate governance discuss the relevance of policy entrepreneurs without explaining what it entails. While all the conditions are useful, the most important aspect of policy entrepreneurs when discussed in urban climate governance is that these people need the political will and motivation to act. This seems like an incredibly important characteristic because even if the policy entrepreneur has the four other characteristics, they will not be used unless the climate manager has the will to make a policy change. Although this has been included in their definition of a policy entrepreneur, it should be reemphasized in the defining characteristics. Thus, a recommendation would be to have five elements included. The methodological challenge of entrepreneurship theory revolves around attribution regarding the extent to which “*we can reliably attribute adoption and implementation of climate governance to the presence and strategies of entrepreneurs, and how can we conclude that the involvement of entrepreneurs was a necessary or sufficient condition for policy change, of whichever kind and in whichever stage of the policy process?*” (Huitema et al., 2018). In this study, the one person interviewed from each municipality was identified as being the local policy entrepreneur driving the climate agenda

which may not be the case. This hinders the reliability of attributing the implementation of climate governance to the presence of policy entrepreneurs. There are limits to the agency perspective and a certain degree of luck, coincidence could have played a role. To counter this, future research using such a framework should use process tracing as a technique to increase the reliability of the research. Since the concept of entrepreneurs with the policy sector was used, it limited the scope of its application to people working directly with policy e.g., civil servants and politicians. Additionally, the author Green (2017) provide a distinction between the characteristics and strategies employed by policy entrepreneurs from which it would be something worth clarifying when using this framework since ‘problem definition,’ ‘leading by example,’ and ‘team building’ seem to reflect more strategies employed while ‘social acuity’ and ‘motivation and persistence’ mirror more characteristics of these actors. This unclarity made it harder to apply the framework and could have influenced the results.

## **6.2.2 Methodological choices**

A number of methodological limitations to this research can be mentioned. Firstly, the focus of this thesis was on rather recent networks that are not yet fully established. Because of this, the impacts they have on climate policy implementation were hard to identify. However, since they were highlighted as very beneficial by the interviewees, they were decided to be kept. Also, the municipal units are at different stages of implementing DK2020’s CAPF, which may have influenced their perceived benefits of the network. Since DK2020 is still recent and resource demanding to make the CAPs, the perceived benefits may feel greater than older networks. Secondly, interviewing only one civil servant from each municipality only captures one interpretation of the situation which impacts the results of this study in two ways. In a first way, this study does not provide a more holistic understanding of the key factors affecting climate policy implementation. To provide a comprehensive representation of these factors at the local Danish level, more research is required. Lastly, the chosen cases and units of this study could have been influenced by a case selection bias. The selection of municipalities and networks may have very well been derived from a bias by choosing cases which are already visible in research and media.

This thesis focused on Denmark which could affect the generalizability of the results. Indeed, Danish municipalities seem to have a supportive political and legal context, and a higher level of autonomy and a higher decision-making power to take urban climate action. These two enabling factors have been identified within literature as important for cities to govern their climate actions. This may limit the generalizability of results to countries which have neither.

## 7 Conclusions and recommendations

This last Chapter presents the answers to the research questions in Section 7.1 posed at the beginning of this research also with describing how the key findings contribute to the current body of literature on the impact of network membership on local climate governance. Furthermore, Section 7.2 contains the recommendations made to practitioners, municipalities and city networks. Lastly, in Section 7.3 the practical implementations for research are presented by identifying areas for future research.

### 7.1 Answering the research questions

The overarching aim of this thesis was to better understand how local actors use national municipal network membership to increase the implementation of their municipality's climate policies. This was done by providing more empirical findings on the three identified research gaps within the field of urban climate governance. The first gap is a lack of focus on SMSTs within the local climate governance literature and the second is the underrepresentation of national municipal networks within the research on horizontal climate governance. The third gap was the fact that individuals who are using climate networks to advance implementation in their municipalities within the research on local climate governance are under researched. Thus, from the overarching aim and three research gaps identified, the following questions were addressed:

- RQ1: How are small and medium-sized municipalities using national city networks to increase the implementation of local climate change policies?
  - SQ1: What are the key factors affecting the implementation of climate change policies in small and medium-sized municipalities?
  - SQ2: What are the main functions of national city networks used by agents in small and medium-sized municipalities?

To answer these research questions, a case study was designed to focus on seven municipalities and two national networks. Twelve semi-structured interviews were conducted with representatives from these different municipalities and networks and four informal discussions took place. Furthermore, documents were collected and analyzed. Results to **SQ1** showed that the two main key factors affecting the implementation of climate policies were the two political actors of policy entrepreneurs and politicians, along with the local framing of climate issues. The former could have either a positive or negative impact on the implementation while the local framing seemed to always be positively beneficial. While the municipalities faced some limitations in their governing capacity, mostly in terms of lack of financial and administrative resources and legal competences, these were overcome by the actions of climate managers. By acting as policy entrepreneurs, they could sway politicians with framing climate change as a growth opportunity. To overcome a lack of power over significant emission sectors, many of the municipalities collaborated with local actors like citizens and local businesses to enable them to take climate actions. In sum, a lack of governing capacity could be overcome by the local framing of climate policies and collaborating with willing political actors. For **SQ2**, results show that the four most important functions for the climate managers are the direct exchange between them, internal mobilization of municipal employees on the climate agenda, GHG accounting, and project support. Direct exchange was the most important for both networks, while the networks offered different benefits. Energibyerne provided direct exchanges, project support through project collaborations, and lobbying, while DK2020 offered more functions related to internal mobilization, GHG accounting, formulating emission reduction goals, and institutionalizing climate trajectories. Thus, the climate managers saw different benefits associated with each, explaining their dual participation in both networks. For **RQ1**, the main finding is that it is not small and medium-sized municipalities using network membership but

the individual representatives that act as policy entrepreneurs to push and steer the implementation of climate agenda. Indeed, many of the most relevant functions used by climate managers are for the direct purpose of influencing something they are lacking on a local level. The results for the overarching research questions demonstrated the importance of adopting an agency perspective as it uncovered the important linkage policy entrepreneurs played between local climate governance and horizontal governance which are typically analyzed separately.

Thereby, this thesis makes a number of academic contributions to the literature on SMSTs in urban climate governance and on national climate networks in horizontal governance by focusing on agency, which have been identified as research gap areas in the introduction Section (1.1). Firstly, this thesis used as subunits of analysis seven small and medium-sized municipalities which provided insights on both the local governance and network governance in which this type of actor is not typically represented. It also applied, tested, and added to the analytical framework of Ryan (2015) which had not been done before on smaller municipalities. Secondly, this thesis contributed to the literature on city networks by focusing on two national networks from an agency perspective and provided more research on national networks, which were identified as lacking studies on. It also showed that smaller municipalities seem to benefit more from collaborations and networks with municipalities within the same country as this requires fewer resources and more opportunities for collaborations. Thirdly, agency was an aspect that had not previously received significant attention in the literature on city networks. By using the theory of policy entrepreneurs, this thesis was able to show the link between the local and network level and the interaction between them.

## 7.2 Implications and recommendations for practitioners

### 7.2.1 For municipalities

A few recommendations are made to municipalities for both on a local level and on a network level. On the local level, the climate agenda can clearly not only fall on the responsibility of one person or one department. Climate change is a complex problem embedded in many different aspects and cannot be treated as one. The mobilization of local political actors, more specifically politicians for adopting climate plans and other departments for climate action implementation, is crucial to have a high implementation of the climate policy and to increasing the governing capacity of the climate department. A way to reach a higher mobilization of local actors is through the local framing of climate policies. What is most important to consider is the local environment and the potential opportunities it presents to the municipality as all have unique contexts. Another way is by participating in city networks. From this, recommendations regarding the network level are that municipalities should engage in municipal networks since there are significant added values in joining them such as this opportunity to mobilize relevant actors, institutionalize climate trajectories within the municipality to anchor the local agenda, the possibility to exchange with other actors from other municipalities who may be facing similar challenges. While some functions require more resource investments, there are many benefits that can be acquired from just joining a network. Nevertheless, there are certain conditions to getting the most out of these networks. The first is to carefully choose who will be representing the municipality in the network. While some network functions do not require direct interaction, there are some functions that do require it. As shown above, it is this person or group of people that can use the municipality's membership to increase implementation of climate policies. Thus, to gain the most out of the functions offered by networks, it is useful that the person is good at networking and has a good network. However, the most important characteristic is that they are highly motivated to initiate change and have the will to use the benefits offered by the networks. Another condition is that the civil servant needs to have enough autonomy to take actions and to also have allocated time to engage in these network activities.

## 7.2.2 For networks

The overall recommendation for networks is to first understand how to best answer the needs of the municipal climate managers. As this research has shown, these actors use the networks to overcome local difficulties they are currently facing and that networks act as this intermediary platform between the climate managers and the local climate implementation. Thus, the best way to create the most value for them and to steer and influence members is to first understand the needs they are lacking. For Energibyerne and DK2020 the most relevant functions were direct exchange between climate managers, internal mobilization of municipal employees on the climate agenda, GHG accounting, and project support. For each of these, recommendations will be given on how to enhance them for networks in general but also for the two networks analyzed. Firstly, the most valued function by the municipal representatives is the direct exchanges with their peers where there is two-way communication. Thus, networks can enhance this function by offering services that allow such exchanges to take place such as field trips, networking events or ongoing interactions in smaller groups rather than by showcasing best practices on network website since this function was not mentioned by any of the interviewees. Secondly, as previously explained, internal mobilization is a function that municipalities can gain from joining networks. Thus, for networks like DK2020 trying to get more members, it seems important to also learn from previously existing networks as to why certain municipalities have not joined networks. For example, it would be valuable for DK2020 to have discussions with the Danish Nature Conservation Agency to understand how they got so many municipalities on board their DN klimakommune network, why certain municipalities did not engage to learn from their experience which would be very valuable for the coming phases of the project. This is important since this network is ending and says to be passing the baton to DK2020. Thirdly, the importance of GHG accounting and creating a coherent CAP framework from the municipalities stems from the lack of direction from the national government. Thus, a recommendation for DK2020 would be to take advantage of the fact that there is finally a central reporting system in Denmark which allows comparison and benchmarking between municipalities. Indeed, benchmarking is a frequently used tool by NGOs to promote local climate policy. For example, the Swedish Society for Nature Conservation presented a climate index of the Swedish local authorities where municipalities participated on a voluntary basis and acted as a motivational push to climb up the ranking. Closely related to this function is the fact that Energibyerne does not formulate emission reduction goals for members which limits their potential to mobilize action outside of the network since it seems to only be the civil servants assisting to the meetings that see value in it. Since DK2020 already provides a common target, it facilitates benchmarking between the municipalities. Thus, a common GHG emission reduction target for all seven municipalities could also be put in place, which would offer more tangible benefits for the other civil servants in each municipality. By way of example, the Hinku network in Finland has implemented such a common reduction target and they also share some resemblance with Energibyerne in their set-up. Lastly, offering project support is relevant for all types of municipalities in the form of funding and joint project implementation. For Energibyerne, it seems that the network has now entered a more critical state in the changing from a knowledge sharing phase to a project implementation phase. For a network to help in this new phase, it is important for networks to help facilitate access to funding through other actors such as EU projects or through collaborations with private actors. Networks can also help with the application process for fundings and having actors to coordinate and take care of the logistics associated with joint projects. The networks can act as coordinators between municipalities in, for example, combining their purchasing power and get economies of scale coupled with big reductions in emissions.

The experiences of the two national networks could also benefit other countries. Indeed, the experiences from Energibyerne could provide valuable insights to the other national networks established within the SmartEnCity project. Indeed, since Energibyerne was the first national

network to be implemented in the SmartEnCity Network, they are further along in their collaboration process. While Danish municipalities may have more self-governing powers and freedom to act, other municipalities can learn from their experience at putting climate on the agenda and embedding it into their organization. It is also through such organized platforms that municipalities can together push the national government. Of course, it also depends on the national context. Danish municipalities benefitted more from this close and intimate collaboration because other national networks already offering opened more informal networking opportunities, which may not be the same elsewhere. Those informal meetings are a useful first step to finding other climate managers with whom to collaborate. For DK2020, the learnings from the Denmark pilot project could be transferred to other countries that do not have national guidance of climate planning and do not have a strong national network where the municipalities can exchange and learn. It is important to know that some of the network functions are beneficial for the municipalities even though they are not engaging with the network since some useful functions are acquired just by joining networks. Smaller municipalities seem to benefit more from exchanging and collaborating with municipalities within their own country. It is not because municipalities are 'dormant' or passive members that they do not see value.

### 7.3 Recommendations for future research

During this thesis, many areas were identified for potential future research. Since both evaluated networks were still in the planning stage, the actual implementation potential of these networks could not be evaluated. Thus, a first recommendation for future studies would be to evaluate if the implementation barriers the municipalities are now facing with climate policy implementation, have been overcome because of these networks. This could be done by means of a longitudinal study of the impact of networks. In fact, repeating this study some years later could also show if the most valuable functions for each municipality have changed and if so, what has caused it. Indeed, systematic, comparative studies of policy entrepreneurs could provide valuable answers to their motivations but also build knowledge on how these actors develop relevant social acuity, are more effective in problem definition, building teams and leading by examples. It could also show if the municipal staff using the different networks' functions are evolving with time according to their changing local needs.

Secondly, the scope of this thesis was delineated on agents within the municipality. During the interviewee with the network representatives, it was also noted that future research into the steering mechanisms used by actors in the governing body of city networks would also provide valuable inputs from an agency perspective. This type of analysis could be complemented with the functions most valued by agents in municipalities and see if there are discrepancies between them. Indeed, cities are not the only ones that are interacting, networks also interact. In this case, they have been noted to interact by collaborating or competing. Moreover, this thesis focused only on municipalities already part of a network. An interesting future area to research would be municipalities but do not engage in city networks. Closely related to this, this thesis has focused on more willing municipalities that have been taking climate actions for over a decade now. Thus, an area of research that still needs more attention is how frontrunners can truly help laggards in leading by example. Lastly, the two frameworks that were used could be applied to a different country context or potentially focus more on adaptation networks. Indeed, collaboration between municipalities on climate adaptation actions often requires close geographical proximity. This would provide a valuable contribution to the literature on national networks. In conclusion, some valuable learnings can be drawn from the results both from the local climate governance and from horizontal governance that could be transferred to other countries. Overall, this thesis showed how small and medium-sized municipalities can take on ambitious climate plans and actions through collaborations and truly using the power in working together.

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## 8 Appendixes

### 8.1 Appendix I – City Size Classification

Table 8-1. Overview of different city classification used in literature

Source	Classification of cities by size
<b>Denmark:</b> Peterson's (2018) academic article did a comparative analysis of strategic energy plans in Danish municipalities. To select his case studies, he separated the municipalities by number of inhabitants.	Very small (<25,000 inhabitants) Small (25,001-40,000 inhabitants) Medium (40 001-50 000 inhabitants) Medium-large 50,001-70,000 inhabitants) Large (70,001-100,000 inhabitants) Very large (> 100,000 inhabitants)
<b>Denmark:</b> Hoff and Strobel (2013) evaluated Danish climate plans and, as independent variables, looked at the correlation with party politics, size of municipality and integration of climate change policies in administration. He also claimed that about 1/3 of Danish municipalities fit the large category and 1/3 the small one. Approximately one third of Danish municipalities have less than 40,000 inhabitants and approximately one third have more than 60,000 inhabitants.	Small municipalities (up to 39,999 inhabitants) (38 municipalities) (38.77%) Middle-sized municipalities (40,000-59,999 inhabitants) (35 municipalities) (35.71%) Large municipalities (over 60,000 inhabitants) (25 municipalities) (25%)
<b>Denmark:</b> Wejs (2014) looked at integrating climate change into governance at the municipal scale in Denmark. She looked at eight case study municipalities. Without referencing specifically to the size, they were referred to as 'small and rural', medium-sized and large.	3 smaller and rural municipalities (Skive, Sønderborg and Lolland) and Albertlund (27,706) (pop between 47,757-76,793 inhabitants) Medium-sized (Herning and Kolding) (85,217-88,519 inhabitants) Large municipalities: Aarhus and Copenhagen (302,618-518,574 inhabitants)
<b>Norway:</b> Kasa et al., (2017) did a most similar case study using two factors: level of priori engagement and size of the municipalities. This study was based in Norway.	Small (<5,000 inhabitants) Medium (5,000-25,000 inhabitants) Large (> 25,000 inhabitants)
<b>Germany:</b> Baush and Koziol (2020) look at policy approaches to increase climate change in small rural municipalities in Bavaria, Germany	Larger cities (20,000 inhabitants and above) Small and medium-sized local authorities (SMLA): less than 20,000 inhabitants.
<b>Portugal:</b> Campos et al. did a survey to analyze the role of climate change in municipal planning agenda.	Small (below 7,500 and 7,500 to 20,000 Large (up to 50,000, 50,000 to 100,000, 100,000 inhabitants above).
<b>Sweden:</b> Fenton (2014) (paper 1) uses the SALAR definition for Swedish municipality sizes. Says that in Swedish context, are	Larger towns: population is 50,000 – 200,000 and over 70% of the population live in urban area

considered large, medium and small but internationally, probably small. SALAR. 2012. Classification of Swedish municipalities, 2011.	Medium: Low density region: less than 300,000 people live with a radius of 112.5 km Small: Commuting municipality: more than 40% of the residential population commute to another municipality to work Small: Goods producing: more than 34% of the residential population aged 16-64 employed in mining, Plan production, manufacturing, energy, etc.
<b>Netherlands:</b> Boehnke et al., 2019 looked at 13 SMSTs in the Netherlands.	50,000-250,000 inhabitants.
<b>Netherlands:</b> Hoppe et al. (2016) characterizes small and medium-sized cities in his study of Dutch municipalities.	Small and medium-sized cities have less than 500,000 inhabitants.
Inderigs og boligministeriet (2006)classifies different sizes for statistics	Municipality with under 20,000 (8) Municipality with 20,000-29,000 (16) Municipality with 30,000- 39,999 (14) Municipality with 40,000-49,999 (21) Municipality with 50,000- 74,999 (23) Municipality with 75,000- 99,999 (9) Municipality with over 100,000 (7)
<i>European City Networks:</i>	
SmartEnCity network is targeted at small and medium-sized cities.	> 300,000 inhabitants
Covenant of Mayors, 2017	< 50,000 inhabitants 50,000- 100,000 inhabitants 100,000-500,000 inhabitants 500,000 inhabitants
<i>European wide articles:</i>	
Reckien et al., 2014 analyzed large and medium-sized cities in Europe and their adaptation and mitigation plans	Large urban areas (<250,000 inhabitants) Medium-sized (50,000 to 250,000 inhabitants)
Reckien et al. (2018) analyzed local climate plans in 885 cities in Europe. The size guide used was from the UA. They used the definition of a European city as urban centers with more than 50,000 inhabitants aligned with EuroStat (2016). For Denmark, that represented only 4 cities.	< 50,000 inhabitants 50,000-100,000 inhabitants 100,000 < 500,000 inhabitants 500,000 < 1. 000,000 inhabitants > 1. 000,000 inhabitants
EuroStat (2016) defined degree of urbanization as a classification of local administrative units (LAUs). An <b>urban center</b> is defined as contiguous (in other words, neighboring or adjoining) grid cells of 1 km <sup>2</sup> with a population density of at least 1 500 inhabitants per km <sup>2</sup> ; these clusters are used to identify all cities with urban centers of at least 50 000 inhabitants. Urban center sizes range from S to XXL to global city	Urban areas: defined here as the sum or average of cities and towns and suburbs; Cities (densely populated areas): where at least 50 % of the population lives in urban centers; Towns and suburbs (intermediate density areas): where at least 50 % of the population lives in urban clusters, but is not classified as a city; Rural areas (thinly populated areas): where at least 50 % of the population lives in rural grid cells.

<p>An <b>urban cluster</b> is defined as contiguous grid cells of 1 km<sup>2</sup> with a population density of at least 300 inhabitants per km<sup>2</sup> and a minimum population of 5 thousand inhabitants.</p> <p><b>Rural grid</b> cells are defined as those grid cells outside of high-density and urban clusters.</p>	
<p>Aligned with the EU project called TOWN which defined the administrative units that did not fit in the ‘cities’ category as being SMSTs which includes the two classes of towns and semi-dense areas and rural areas of the DEGURBA method (Servillo et al., 2014).</p> <p>three classes of towns: larger cities (HDUC) (850 larger cities) (46.3%), SMSTs (24.2%) (8,414), very towns (69 000).</p>	<p>‘High Density Urban Clusters’ (a population of more than 50,000 and a population density of more than 1,500 inhabitants/km<sup>2</sup>)</p> <p>Small and medium-sized towns (SMSTs) (i.e. have a population density between 300 and 1,500 inhabitants/km<sup>2</sup> and/or between 50,000 and 5,000 inhabitants).</p> <p>‘very towns’ which, in spite of their population density above the threshold of 300 inh.km<sup>2</sup>, do not reach the minimum population threshold of 5,000 inhabitants.</p>
<p>Degrees of urbanization (DE (EuroStat, 2020)</p> <p>Level 2 was created to identify medium and small settlements, in other words, towns and villages.</p>	<p>Level 1: cities (large settlements)</p> <p>Level 2: Towns and suburb areas (intermediate-density areas)</p> <p>Level 3: Rural areas (thinly populated areas)</p>

Source: Own elaboration

The discrepancies in determining the size of a city have been found also for how to define the SDG goals. To uniformize the classification system, the United Nations Statistical Commission endorsed in 2020 a new global method for classifying and comparing cities, urban areas and rural areas. This new method is called ‘the degree of urbanization’ (DEGURBA) and classifies the entire territory of a country into three classes:

- *Cities*: densely populated areas: at least 50% of the population lives in urban centers
- *Towns and suburbs/semi-dense areas*: intermediate density areas: less than 50% of the population lives in rural grid cells and less than 50% of the population lives in urban centers
- *Rural areas*: thinly populated areas: more than 50% of population lives in rural grid cells

EuroStat, the Statistical Office of the European Union, adopted these degrees for its member states. In Denmark, there is a rather even distribution of degrees of urbanization: cities (18 municipalities, 18.37%); towns and semi-dense areas (34 municipalities, 34.69%); and rural areas (46 municipalities, 46.69%). While Denmark only has a total population of 5.82 million inhabitants, its average population is the highest in the EU (59,415 inhabitants vs. 3,530 inhabitants on average in the EU). This is due to its low number of local administrative units (LAUs), which are the municipalities and communes of the European Union. Since the structural reform in Denmark that took place in 2007, the number of municipalities went from 271 to 98 municipalities or LAUs. The average LAU size in Europe is 3,527. An EU project called TOWN aimed at constructing new knowledge about European small and medium-sized towns. They defined the administrative units that did not fit in the ‘cities’ category as being SMSTs which includes the two classes of towns and semi-dense areas and rural areas of the DEGURBA method (Servillo et al., 2014).

## 8.2 Appendix II – List of practitioner documents

The list of documents below makes up the data collection from document sources of information. The document review includes 9 reports, 8 websites, 2 news articles, 1 conference, and 1 private meeting notes.

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### Networks

- Energibyerne and SmartEnCity
  - Energibyerne. (n.d.). *Energibyerne*. <https://energibyerne.dk/>. Retrieved December 8, 2020, from <https://energibyerne.dk/>
  - Minutes Energibyerne meeting. (2021). *Minute meetings* [Personal communication].
  - SmartEnCity. (2017, May 10). *SmartEnCity Conference Week—Cities are created to serve the citizens' needs. SCC follower city needs & challenges* [Webinar]. <http://smartencitynetwork.eu/City.aspx?id=ced6df2a-dee3-456f-bf7b-2a7ea42374ed&tags=>
- DK2020
  - Realdania. (2020a, November). *Dk2020- Fact sheet*. Realdania. <https://realdania.dk/projekter/dk2020>
  - Realdania. (2020b, November 19). *DK2020: 46 municipalities have joined in- will be drawing up local climate plans according to international standards*. Realdania. <https://www.realdania.org/news/latest-news/2020/46-municipalities-have-joined-in>

### Municipalities:

- Frederikshavn
  - Energy City Frederikshavn. (2012). *Action Plan for EU Covenant of Mayors 2012-2015*. [https://mycovenant.eumayors.eu/docs/seap/13949\\_1511273777.pdf](https://mycovenant.eumayors.eu/docs/seap/13949_1511273777.pdf)
  - Frederikshavn Kommune. (2021). *DK2020 Klimaplan 2030* (p. 67) [Climate action plan]. [https://www.energibyen.dk/media/4xxlsvqw/dk2020-klimahandlingsplan\\_07-03-2021.pdf](https://www.energibyen.dk/media/4xxlsvqw/dk2020-klimahandlingsplan_07-03-2021.pdf)
  - GO100percent. (n.a). *Energy City Frederikshavn*. [http://www.go100percent.org/cms/index.php?id=69&no\\_cache=1&tx\\_ttnews%5Btt\\_news%5D=184&cHash=5d45857d35286d62dbb6cd1fbcf98eaf](http://www.go100percent.org/cms/index.php?id=69&no_cache=1&tx_ttnews%5Btt_news%5D=184&cHash=5d45857d35286d62dbb6cd1fbcf98eaf)
- Horsens
  - C2C CC. (n.a). *C14: Flood-proofing Horsens' City Centre*. Coast-to-Coast Climate Challenge. <https://www.c2ccc.eu/english/subprojects/c14-flood-proofing-horsens-town-centre/>
  - Horsens Kommune. (2011). *Strategisk energiplan* (p. 47). [https://mycovenant.eumayors.eu/docs/seap/4159\\_1370868700.pdf](https://mycovenant.eumayors.eu/docs/seap/4159_1370868700.pdf)
  - Schütt, T. (2020, November 20th). *Med i klima-samarbejde: Horsens skal være CO2-neutral inden 2050*. <https://hsfo.dk/artikel/med-i-klima-samarbejde-horsens-skal-vaere-co2-neutral-inden-2050>
- Høje-Taastrup
  - Høje-Taastrup Kommune. (2021). *Klimaplan 2030- Danmarks grønneste vækstkommune* [Climate action plan]. <https://www.htk.dk/Om-kommunen/Klima-og-energi/Klimaplan-2030>

- SmartEnCity. (n.a). *Høje-Taastrup*.  
<http://smartencitynetwork.eu/City.aspx?id=940446c3-b176-4282-baa6-a45afa4d1a7a&tags=>
- Middelfart
  - klimalaboratoriet. (n.a.). *DK2020: Middelfart Kommune er med til at lede klimakampen*.  
<https://klimalaboratoriet.middelfart.dk/DK2020>
  - Middelfart Kommune. (2020). *DK2020 klimaplan Middelfart Kommune*.  
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  - Middelfart Kommune. (n.a.). *Climate Laboratory: The municipality of Middelfart are taking global responsibility through local action*.  
<https://climatelab.middelfart.dk/About%20The%20Climate%20Lab>
- Ringkøbing-Skjern
  - Hegelund Jensen, J. P. (2020, January 7). An Impressive Climate Strategy for a Small Danish Municipality. *ICMA*. <https://icma.org/articles/pm-magazine/impressive-climate-strategy-small-danish-municipality>
  - Ringkøbing-Skjern Kommune. (2015). *Strategic energy plan for Ringkøbing-skjern municipality- Energy 2020 strategy 2015-2018* (p. 40) [Strategic energy plan].  
[https://mycovenant.eumayors.eu/docs/seap/13967\\_1487771132.pdf](https://mycovenant.eumayors.eu/docs/seap/13967_1487771132.pdf)
- Skive
  - Energibyen Skive. (2020, October 8). *Om Energibyen Skive*.  
<https://energibyenskive.dk/om-energibyen-skive/energibyen-skive/>
  - SmartEnCity. (n.a.). *Skive*. <http://smartencitynetwork.eu/City.aspx?id=0f813fa6-e95d-4997-8d2c-c5bcdca14c0e&tags=>
  - Skive Kommune. (2021). *2029 ENERGI / BÆREDYGTIGHED / STRATEGI* (p. 17).  
<https://energibyenskive.dk/media/ny0dwniu/skive-kommune-klima-energi-strategi-2029-enkeltsidet-dk.pdf>
- Sønderborg
  - Sønderborg Kommune. (2020). *DK2020 Sønderborg Kommunes DK2020 Climate Action Plan* (p. 100) [Climate action plan].  
[https://sonderborgkommune.dk/sites/all/files/Forvaltninger/Intern%20Stab/Beredskab/Dokumenter/dk2020\\_soenderborg\\_godkendt.pdf](https://sonderborgkommune.dk/sites/all/files/Forvaltninger/Intern%20Stab/Beredskab/Dokumenter/dk2020_soenderborg_godkendt.pdf)
  - ProjectZero. (2020). *Roadmap 2025: 50 steps towards a carbon neutral Sønderborg* (p. 33).  
<http://brightgreenbusiness.com/toppages/our-masterplan-roadmaps-2>

### 8.3 Appendix III – List of interviewees

Table 8-2. Overview of interviewees conducted during thesis

N	Name of organization/municipality	Type of Organization in thesis context	Function/role of interviewee	Date of interview and duration
1	Høje-Taastrup	Municipality	Head of energy and climate Section, department of planning and environment and Energibyerne representative	18/02/2021 (54 minutes)
2	Middelfart	Municipality	Head of climate and energy and Energibyerne representative	18/02/2021 (1h03)
3	Sønderborg	Municipality	Municipal Climate Coordinator, sustainability, nature and rural department	17/03/2021 (52 minutes)
4	Sønderborg – ProjectZero	Public-private partnership	ProjectZero Director and network representative	24/02/2021 (57 minutes)
5	Frederikshavn	Municipality	Project Director, Energy City Frederikshavn and Energibyerne representative	4/03/2021 (1 hour)
6	Skive	Municipality	Team leader, Plan and support-Energibyeren Skive and Energibyerne representative	24/02/2021 (43 minutes)
7	Ringkøbing-Skjern	Municipality	Energy Secretariat in the External Development department and Energibyerne representative	25/03/2021 (1h33)
8	Horsens	Municipality	Sustainability consultant in the Environmental and Technical department and Energibyerne representative	25/03/2021 (1h14)
9	Tankegang	Danish Communication agency	Journalist and Director of Tankegang	23/02/2021 (58 minutes)
10	PlanEnergi	Energy consultancy	Building engineer and project manager	16/02/2021 (1h02)
11	C40 representative	Megacity network	Regional team and DK2020 Project officer	30/11/2020 (53 minutes)
12	Realdania	Danish private foundation	Project Chef at Realdania and DK2020	7/04/2021 (58 minutes)

Table 8-3. List of discussions that took place during thesis

N	Title	Type of Organization in thesis context	Function/role of interviewee	Date of interview and duration
1	Replication manager SmartEnCity	Institute of Baltic Studies	Project manager for Estonian Network and researcher	16/02/2021 (44 minutes)
2	City network expert	Lund University	Academic researcher	23/02/2021
3	Strategic planning expert	Aalborg University	Academic researcher	5/02/2021
4	Network coordinator	SmartEnCity	Project Manager at ProjectZero and Network coordinator for SmartEnCity and Energibyerne	Multiple meetings during the course of thesis

## 8.4 Appendix IV – Interview guide

The following text gives an overview of the interview questions. The specific questions were adapted per actor interviewed based on the background of the interviewee.

*Table 8-4. Thematic topics of the interviews and questions' relevance within the research framework*

<b>Thematic topics of the interviews</b>	<b>Question's relevance within research framework</b>
1. The climate background of the municipality	To understand when the municipality started to get involved in climate action (mitigation and adaptation) and the reasons for this. It was also to understand the interviewee's role and place within the municipality.
2. Concrete climate actions implemented in the municipality	To understand the range of concrete actions implemented in the municipalities, their motivations, find out if a frontrunner in certain areas and the potential gap between planned actions and actions implemented.
3. The effects of network membership on the organization of the climate work in the municipalities	To understand the networks they are most active in, the perceived benefits from participation in networks in general and more specifically in the Energibyerne network, get their perspective on the network and its participants.

*Source: Own elaboration, inspired by Karhinen et al. (2021)*

1. What are your functions within the organization? Under which department are you located?
2. When did your municipality begin to engage in climate change?
3. In which areas has your municipality focused its attention on?
4. How has your municipality taken action/focus areas in the past? How did the implementation of the initiatives go about?
5. With which municipality do you collaborate the most?
6. Which city networks are you part of, both nationally and internationally?
7. In which of these networks do you participate the most in?
8. What are your perceived benefits of participating in city networks in general?
9. What originally convinced you to join the Energibyerne collaboration?
10. What resemblances or differences do you see between the municipalities?
11. What is most valuable for you to participate in this network?
12. Why was it decided to make it a closed club?
13. How do you perceive the sustainability of the network?

## 8.5 Appendix V – Initial coding structure

- Local climate governance
  - Local governing capacity
    - Legal competences
    - Human resources
    - Financial resources
    - Information and data management
  - Political and social actors
    - Businesses
    - Citizens
    - Politicians and level of politicization
    - Internal departments
  - Local framing of climate policies
    - Climate policies linked to local issues
    - Climate policies generating socio-economic or environmental benefits
- Network climate governance
  - Functions
    - Enabling direct exchange
    - Enabling internal mobilization
    - Formulating emissions reduction goals
    - Institutionalizing climate trajectories and governance
    - Lobbying
    - Offering project support and consultancy
    - Refer to global context
    - Wider GHG scope/GHG accounting
- Policy entrepreneurs
  - Social acuity
  - Building teams
  - Problem definition
  - Leading by example
  - Motivation and persistence

## 8.6 Appendix VI – Overview of municipal networks in Denmark

Table 8-5. Overview of municipal networks in Denmark

Network	Geographical level	Focus area	Total members	Members in Denmark	Members from case study
DK2020	National	Climate action plans	66	All	7
DN Klimmakommune (Danish Society for Nature Conservation (Climate municipality))	National	Reduce CO <sub>2</sub> emissions from municipality as a company	71	71 (8 are klimakommune +)	6 (Hoje-Taastrup and Middelfart are +)
Energiform Danmark	National	Energy sector		59 (CONCITO)	Skive, R-S, Sønderborg
Global Covenant of Mayors	International	Mitigation	10 724 cities	43 (EU)	Frederikshavn (2012), Horsens (2011), Hoje-Taastrup (2012),
Energibyerne (SmartEnCity Network)	European	Energy	58	10	7
Aalborg commitments (2004)	European	Understanding of sustainability	Over 700	3 (CONCITO 5)	Frederikshavn
Aalborg charter (1994)	European	Urban sustainability initiative	2708	11	Hoje-Taastrup
Energy Cities (EU) (full individual members only)	European	Mitigation		3	Sønderborg, Frederikshavn
ICLEI (Local Governments for Sustainability)	International	Sustainable urban development	More than 1750	3 (CONCITO)	
C40	International	Mitigation and adaptation	97	1 (Copenhagen)	-
100 Resilient Cities	International			1 (Vejle)	-
Climate Alliance (full individual members only)	European	Mitigation and adaptation	1871	1 (Albertslund)	-
EuroCities	European		More than 190	2 (CPH, Aarhus)	-

Source: Own elaboration, some data from CONCITO (2020)

## 8.7 Appendix VII – Table of different characteristics of the networks of Energibyerne

Table 8-6. Comparison of the networks of Energibyerne and DK2020

Energibyerne	DK2020
<b>Main objective of the network</b>	
Their goal is to make a fossil free environment in their cities as soon as possible and to do so they have started sharing and exchanging knowledge about energy-efficient solutions, citizen engagement, transport, strategic energy planning and other. (Energibyerne, n.d.)	Their goal is to support municipalities in developing, upgrading or adjusting their existing work on climate action to global best practice, and ultimately developing CAPs in line with the 1.5 degree goal in the Paris Agreement (Realdania, 2020b).
<b>Geographical scope</b> <i>(if they operate on an international, regional, national, or subnational level)</i>	
<ul style="list-style-type: none"> <li>• National (Denmark)</li> </ul>	<ul style="list-style-type: none"> <li>• National (Denmark)</li> </ul>
Size of the membership and governing bodies	
<ul style="list-style-type: none"> <li>• Seven medium-sized municipalities</li> <li>• Two companies</li> <li>• One foundation</li> </ul>	<ul style="list-style-type: none"> <li>• 67 municipalities</li> <li>• Public actors</li> <li>• 2 foundations</li> <li>• 1 city network</li> <li>• Regions</li> </ul>
<b>Topical coverage</b>	
<ul style="list-style-type: none"> <li>• Specific sectoral interventions in energy</li> <li>• Smart energy cities</li> <li>• Three main focus areas for their collaboration: buildings (energy renovation &amp; retrofitting), green mobility (electrification of future green transport and charging infrastructure) and replication of one of the municipalities' GreenLab concept (industrial green business park) (SmartEnCity, 2020).</li> </ul>	4 pillars of CAPF: <ul style="list-style-type: none"> <li>• Adaptation</li> <li>• Mitigation</li> <li>• Inclusivity</li> <li>• Governance</li> </ul>
<b>Outputs</b>	
<ul style="list-style-type: none"> <li>• Joint pilots and projects, municipality meetings</li> <li>• Folkemødet Festival</li> </ul>	
<b>Membership terms</b> <i>(what it takes to become a member)</i>	

<ul style="list-style-type: none"> <li>• Exclusive</li> <li>• Voluntary, free to leave</li> </ul>	<ul style="list-style-type: none"> <li>• Inclusive/exclusive</li> <li>• Voluntary, free to join and leave</li> <li>• The DK2020 was not open. There is a call for membership application over three rounds. A first group of 20 cities were accepted in 2019 as pilot cities, a second group of 46 cities in 2020 and a third call later this year.</li> </ul>
<p><b>Governance structure</b></p>	
<ul style="list-style-type: none"> <li>• Single-tiered governance (centered on a single secretariat leading the whole organization)</li> </ul>	<ul style="list-style-type: none"> <li>• Two-tiered governance structure and pluralized by having private actors involved.</li> </ul>
<p><b>Funding</b> (<i>type of funding used for activities and administration</i>)</p>	
<ul style="list-style-type: none"> <li>• Not funded per city level, meetings and travels to sites is paid for by SmartEnCity which has funds for travel costs.</li> <li>• Cities funded part of the Folkemødet tent</li> <li>• They are looking for funds at the EU level</li> <li>• They paid for the website</li> </ul> <p>EU funding for 2 actor salary and for travel expenses (SmartENCity) Municipalities pay for Energibyerne website and for tent at Folkemødet</p> <ul style="list-style-type: none"> <li>• Looking for EU funding for projects</li> </ul>	<ul style="list-style-type: none"> <li>• Realdania: 15 million DKK</li> <li>• 5 DK Regions: 15 million DKK</li> <li>• KKR: 15 million DKK</li> </ul>
<p><b>Impact functions</b></p>	
<ul style="list-style-type: none"> <li>• Enabling direct exchanges</li> <li>• Offering project support/ consultancy</li> <li>• Exchange of best practices</li> <li>• Enabling access to funding</li> </ul>	<ul style="list-style-type: none"> <li>• Enabling internal mobilization</li> <li>• Formulating emission reduction goals</li> <li>• Institutionalizing climate trajectories and governance</li> <li>• Offering project support/ consultancy</li> <li>• Enabling access to funding</li> <li>• Advocacy and lobbying</li> <li>• Referring to a global context</li> <li>• Enabling green city branding</li> <li>• Helping with GHG accounting</li> </ul>

## 8.8 Appendix VIII – Background information on Energibyerne

Before the national networks were officially formalized, the collaboration between the seven Danish municipalities started on a more informal level. Folkemødet, People’s political festival, is an annual Danish Democratic festival which happens every year on the island of Bornholm where Danish citizens come to have dialogue about important issues with Danish politicians (e.g., youth, climate, education). There are many events taking place divided into various themes amongst which was the ‘Energy Area’. Tankegang, a small Danish communications agency for municipalities, approached ProjectZero with the idea of having a common tent for a number of energy cities who would debate on climate change and the green transition of cities where Tankegang would facilitate the discussions. Shortly afterwards, they discussed who to invite and *“that was the beginning of Energibyerne. The next summer we had the tent at Folkemødet for debates. After that we decided to create a more stable cooperation, Energibyerne.”* (Tankegang rep). Since this project collaboration turned out to be quite a success, the participating municipalities eventually officially became ‘Energibyerne’, the so-called Energy Cities in Denmark *when they decided to work together and collaborate with each other on a national level in Denmark”* (Tankegang rep). At the start, their goal was to *“make a fossil free environment in their cities as soon as possible and to do so they have started sharing and exchanging knowledge about energy-efficient solutions, citizen engagement, transport, strategic energy planning and other.”* (Energibyerne, n.d.). The other Danish municipalities part of the EU SmartEnCity Network had also been invited to be active members (Aero, Aalborg, and Odense), but due to lack of time or a turnover in employees, these municipalities remained passive members of the EU-wide network and hence were never part of Energibyerne. Since this national network turned out quite successful, it was suggested to the SmartEnCity partners to work with creating national based networks to influence more cities in each country. From then onwards, it was decided to create national sub-networks in each of the project cities and their aim was to *“extend the replication process and knowledge transfer, making it easier for cities to implement smart city initiatives successfully in similar governmental, financial and social contexts.”* (Realdania, 2020b).

Since 2020, the network has had three main focus areas for their joint project implementation. These common focus areas are energy efficiency in buildings with citizen engagement, green mobility, and the replication of one of the municipality’s (Skive) industrial green business park (Power-to-X). Each of these focus areas has a chairman who is responsible for leading the agenda and the project. PlanEnergi Power-to-X chairman who developed a proposal sent to the Danish Energy Agency to support them in their work in implementing this project in all the seven municipalities.

## 8.9 Appendix IX – Overview of the seven municipalities

Table 1: Overview of the seven municipalities in the *Energibyerne* collaboration (Social og indenrigsministeriet, 2020)

Municipalities/ characteristics (2020)	Høje-Taastrup	Horsens	Frederikshavn	Middelfart	Ringkøbing- Skjern	Sønderborg	Skive
Population size <sup>1</sup>	Medium-sized city	Large-sized city	Medium-sized city	Small-sized city	Medium-sized city	Large-sized city	Medium-sized city
Coastal or inland	Inland	Coastal	Coastal	Coastal	Coastal	Coastal	Coastal
Full time unemployment (% of 17–64-year-olds) (2019)	3.7%	2.9%	3.5%	2.3%	2.4%	2.9%	2.0%
Population share in urban settlements (%)	98.8%	89.2%	87.3%	81.6%	71.8%	88.2%	77.6%
“Rural degree” <sup>2</sup> (remote, rural, intermediate, urban)	Urban	Intermediate	Rural	Intermediate	Remote	Rural	Remote
Number of employees	4,500	6,000	3,904	3,700	3,600	5,500	3,655
Operating income per inhab. (2021)	6,862	4,936	4,700	10,029	5,247	4,848	7,439
Proportion of commuters (%)	69.6 (out) 79.7 (in)	39.1 (out) 37.2 (in)	23.6 (out) 22.3 (in)	48.1 (out) 46.2 (in)	22.8 (out) 26.2 (in)	16.4 (out) 15 (in)	29.2 (out) 26.6 (in)

Source: Own elaboration (data from *Social og indenrigsministeriet*, 2020)

<sup>1</sup> small = 39 999; medium= 40 000-60 000, large more than 60 000)

<sup>2</sup> The rural degree from the national strategy for Danish rural development 2007-2013 is based on 14 indicators (Population per km<sup>2</sup>; Population in rural areas and towns with less than 1000 inhabitants; Proportion of the municipality's area in rural zones; Percentage employed in agricultural enterprises; percentage of population aged 17-64 years; Percentage of the population aged 25-44 years; Employment trends, 1994 – 2004; Population trends, 1994 – 2004; Average distance to motorway; Jobs in proportion to employees; Percentage of the workforce with basic education, 2005; Percentage of the workforce with medium or tertiary education, 2005; Average distance to areas with a high surplus of jobs, 2004; Taxation base per capita, 2007) that consider socio-economic demographic and urbanization factors and has 4 classes in its classification system: remote/peripheral municipalities (16), rural municipalities (30), intermediate municipalities (17), urban municipalities (35). Part of the Danish Rural Development Program 2007-2013 for the implementation of the EU agricultural policy, Ministry of Food, Agriculture and Fisheries