The role of network participation in climate change mitigation: a city-level analysis

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ABSTRACT
Cities and networks play an important role in climate change mitigation. Various international, regional, and local networks seek to increase cooperation between cities or between cities and other stakeholders. However, we still have a poor understanding of how these formalised networks help cities to mitigate climate change at different levels of urban climate governance. Here, I analyse experiences of participation in formal climate change mitigation-related networks from the global to the local level in three European capital cities: Helsinki, Madrid, and Stockholm. As multilevel networking is a strategic tool for cities, different benefits are highlighted at different levels of governance. Some networks are more oriented towards politics and planning, while others are more practical. Formalised networking is also networking between individual people, which should be studied further. The results demonstrate both the advantages of networks and challenges in developing beneficial networking to support climate change mitigation.

Introduction
Climate governance is not strictly state-led, but happens on multiple levels and is advanced by multiple actors (Bulkeley and Newell 2015; Wurzel et al. 2019). Cities are considered important agents when it comes to climate change mitigation and adaptation, and high expectations are placed upon them to lead the change towards sustainability (Kousky and Schneider 2003; UNEP 2011; Revi et al. 2014; Acuto 2016; Barber 2017; ICLEI – Local Governments for Sustainability 2018; Solecki et al. 2018; van der Heijden et al. 2019b). Rapid urbanisation has highlighted the role of cities as arenas of social and environmental challenges (Romero-Lankao and Dodman 2011). Cities have been increasingly engaged in tackling climate change, and states have delegated certain responsibilities to them, especially those related to implementation (van der Heijden 2017). Global climate governance architecture is both multilevel and polycentric and relies on both informal and formal networks (Bulkeley et al. 2014). The importance of cities and city networks has grown along with dissatisfaction with the leadership of nations in international climate action (Bulkeley 2010).

Urban networking is not a new phenomenon; city networks are known to be well institutionalised (Acuto and Rayner 2016; Acuto and Leffel 2020). However, the number of formalised networks has increased in recent years, particularly those addressing environmental concerns (Acuto 2016; Acuto and Leffel 2020). Here, I define a formalised network as a network that has coordinated activities, including, for example, those related to information sharing, policy-making, or exchange of experiences. Further, a formalised network comprises members who make the decision to join it, in contrast to the more spontaneous and informal networking between actors, such as networking between city officials who know each
other through their previous posts. This interpretation follows previous definitions (Acuto and Rayner 2016; Gordon and Johnson 2017; Davidson et al. 2019a), but it differs insofar as it does not require that members are mainly cities. For example, in a city-to-business network (CBN), most members are companies, and some networks have both cities and companies as members.

In practice, networking is largely communication between members of the network and between members and the network organisation (Keiner and Kim 2007). Therefore, it is logical to consider networks as platforms of information sharing (Bulkeley et al. 2003). However, among the flows of information, some networks channel flows of resources, and some have grown into potentially powerful actors themselves, trying to impact policies at different levels and advocating certain solutions (Bulkeley et al. 2003; Keiner and Kim 2007; Rashidi and Patt 2018, Nielsen & Papin 2020).

Despite the enthusiasm surrounding cities and formalised networks in mitigating climate change, empirical evidence on how beneficial they are continues to be limited (Busch et al. 2018; Wolfram et al. 2019; van der Heijden et al. 2019a), and even more so when it comes to multilevel networking. Therefore, in this paper, I ask:

**In what ways do cities benefit from different formalised networks in multilevel governance in the context of climate change mitigation?**

In the following section, I review previous literature focusing on the benefits that cities have gained from networks, along with the gaps that remain. This sources my qualitative analysis, which I present in the third section with the cases and materials. Here, I do not limit the analysis to direct mitigation results only but consider other benefits as well. The results show that cities use networks strategically at multiple levels. The benefits are similar across these levels, although the emphasis changes. I conclude the paper by arguing that the recognised benefits give networks two main roles: a political one and a practical one.

**Literature**

Several formal city networks have emerged globally, regionally, and nationally. Earlier literature has connected numerous benefits to city-to-city networking (see Table 1). For example, based on the theoretical frameworks advanced by Bulkeley et al. (2003) and Andonova et al. (2009) along with results from an analysis of German cities, Busch (2015) presented a framework in which the transnational municipal networks (TMNs) serve as platforms, consultants, commitment brokers and city advocates. Later, Busch et al. (2018) continued analysing the influence of TMNs in German cities, finding that networking influences cities mainly through the processes of enabling internal mobilisation, formulating goals for emission reduction, institutionalising climate trajectories, enabling direct exchange, and offering project support. In their statistical analysis, Rashidi and Patt (2018) found that membership in ICLEI and/or C40 increases the amount of climate policies adopted. The literature on networking benefits (Table 1) serves as the basis for the analyses in the next section. However, in this article, I amplify the analysis of networks other than TMNs.

The networks themselves have highlighted learning and information sharing among the benefits they produce, and these benefits have also been recognised as central in the theoretical literature (Bulkeley et al. 2003; Andonova et al. 2009). Empirical studies have also supported this determination (Kern and Bulkeley 2009; Busch 2015; Busch et al. 2018). When analysing the TMN governance instruments tools, Papin (2020) found almost all enabled information sharing. There have also been studies focusing specifically on learning and information sharing (Lee and van de Meene 2012; Mocca 2018; Haupt et al. 2019). According to Haupt et al. (2019), networking is often limited to information sharing that cannot be considered actual learning. Instead of horizontal and equal learning networking seems to encourage dynamics in which certain cities pictured as role models from whom others then learn (Mocca 2018).

Previous empirical studies on the benefits of networking have concentrated on networking at one level (e.g., networking through TMNs). However, TMNs are not the only formal networks acting in multilevel urban climate governance. Some city networks work at the national level, such as Red Española de Ciudades por Clima (Climate network of Spanish cities) in Spain or Hillineutraalit kunnat (Carbon neutral municipalities, HINKU) in Finland. Some cities have developed CBNs, such as Climate Partners in Helsinki, where businesses are cooperating with each other and the city. This creates a new
Table 1. Networking benefits recognised in previous literature.

| Networking benefit                          | Definition                                                                 | Earlier references (theoretical and empirical):                                                                 |
|---------------------------------------------|---------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|
| Access to resources                         | Networking helps the city to secure funding, a workforce or other resources. | Kern and Bulkeley 2009; Andonova et al. 2009; Kern and Alber 2009; Busch et al. 2018; Haupt et al. 2019; Karhinen et al. 2021. |
| City branding                               | Networking helps the city to build its brand, e.g., as a Green City or climate actor. | Mocca 2017; Busch et al. 2018; Haupt et al. 2019.                                                            |
| Individual networks                         | Formalised networks help to create informal networks, e.g., between the experts working for the cities. | Busch et al. 2018.                                                                                          |
| Information sharing                         | Networks support information sharing between members.                    | Bulkeley et al. 2003; Kern and Bulkeley 2009; Andonova et al. 2009; Lee and van de Meene 2012; Bansard et al. 2017; Busch 2015; Busch et al. 2018; Mocca 2018; Haupt et al. 2019; Karhinen et al. 2021. |
| Learning and new ideas                      | Networking helps the cities to get inspired, develop new solutions or apply the solutions of others in their own context. | Bulkeley et al. 2003; Kern and Bulkeley 2009; Andonova et al. 2009; Lee and van de Meene 2012; Busch 2015; Busch et al. 2018; Mocca 2018; Haupt et al. 2019; Karhinen et al. 2021. |
| Legitimacy of action/motivation             | Networking helps to build the legitimacy of climate action, e.g., among politicians, or creates motivation for taking action. | Kern and Bulkeley 2009; Lidskog and Elander 2010; Lee and Koski 2015; Busch et al. 2018; Karhinen et al. 2021. |
| Lobbying/city advocacy                      | Networks help cities to lobby for their point of view, e.g., in meetings, whether on the national or EU level, when broader frames of climate action, such as legislation, are discussed. | Bulkeley et al. 2003; Busch 2015; Busch et al. 2018.                                                         |
| Policy initiative creation/goal setting and monitoring | Networks create (or help to create) policy initiatives, and set (or help to set) goals for urban climate action. They require and/or offer tools for monitoring climate action. | Bulkeley et al. 2003; Kern and Alber 2009; Busch 2015; Busch et al. 2018; Rashidi and Patt 2018; Karhinen et al. 2021. |

Local level of networking in urban climate governance. These networks are one way of engaging the private sector that the literature finds to be increasingly important. Shifting focus from government to governance has increased the importance of private sector and participatory approaches in steering urban affairs (Gupta et al. 2015,) and engaging the community broadly in planning is one of the keys to closing the rhetoric-reality gap (Pitt 2010). The context of heightened neo-liberalism increases the legitimacy of voluntary, market-based approaches (Bulkeley and Newell 2015). The actions of private actors create most of the greenhouse gas emissions and reducing them is a central target of climate governance (Abbott 2018). Therefore, they need to cooperate with the private sector, and networks offer one way to accomplish this. Private actors have been exhibiting voluntary activity in the field of climate action (Bulkeley and Newell 2015, p. 92). Nevertheless, despite these developments, literature on the possible benefits of CBNs is scarce.

Overall, there are two gaps in the existing literature. First, it remains unclear how beneficial networking is, even when it comes to TMNs. The empirical evidence of the benefits of networking from the city point of view continues to be limited (Busch et al. 2018), as is our understanding of how networking leads to verifiable emission reductions (Gordon and Johnson 2018; Rashidi and Patt 2018) or how effective they are (Wolfram et al. 2019). Second, it remains unclear whether the benefits recognised in the context of TMNs (Table 1) apply to different networks in multilevel governance. There are some results suggesting that networking with geographically close cities is important (Pitt 2010), and that it is important to break the silos of the city organisation (Lenhart et al. 2014). There is early evidence that national level networking helps municipalities to decrease their emissions, and mechanisms for this are the same as TMNs offer (Karhinen et al. 2021). However, we need more research on burden sharing between different networks (Gordon and Johnson 2018).

Here, I contribute to filling these gaps in the literature by analysing networking across all levels, from networks inside city organisations to global city-to-city networking. The results offer empirical evidence of how European cities make use of...
different networks in their climate change mitigation efforts, further revealing those benefits drawn from networking that cities consider the most important.

Materials and Methods

I selected three case cities for this study: Helsinki, Madrid, and Stockholm. They are interesting for the purpose of my research, since they have all participated in various climate-related networks for some time. This allows observation of the effects of networking at multiple levels. The case cities are in different countries but share similar contexts: They are all capital cities of European Union (EU) countries, which means that they are all wealthy on a global scale; share the international context of the EU; and are special cases inside their respective countries. Madrid can be described as a large city, while Helsinki is medium-sized, and Stockholm falls somewhere between (Lamb et al. 2019). None of these cities are among the most studied cases of urban climate change mitigation (Lamb et al. 2019).

There are, however, some differences between these cities. Stockholm was the first city to win the European Green Capital award and has been described as a model of sustainable urban living (European Commission 2010). It is one of the ‘innovator cities’ in the C40 network, which means the network considers it an international leader in climate action (for an exact definition, see C40 2012). It plays an important role in other international and national level networks. They also have formalised local networks. Madrid is not that well-known for being active in climate action, even though it is also a member of C40 (and at the time of conducting this study, the European office of C40 is in Madrid). Madrid also lacks a local level formal network. In contrast, Helsinki is considered to perform well regarding climate action, but not as well as Stockholm. Helsinki is not a member of C40, but the city participates in other international networks while also having local formal networks. Together, these cities offer three points of view into multilevel networking.

I collected the data for the present study by interviewing key stakeholders in the case cities in 2017. I selected the first respondents by identifying the climate coordinators of the cities from their webpages and through my earlier contacts. Then, I selected prospective respondents for interviews with the snowball sampling method (Lynch 2013) by asking the coordinators if they knew who else in the city organisation was working with formalised networks. I also asked the respondents about their contacts in the other case cities and outside the city organisation.

All the studied cities participate in several networks, but not all the respondents were working with every network the city was participating in. The results reflect the views of the respondents that have been shaped by their work. However, I also asked them to evaluate the concept of networking from the wider perspective of the city. Table 2 summarises

Table 2. The respondents’ work with different networks. ‘Partly’ means that the respondent told that they work with the network, but not as actively as with other networks they work with.

| Respondent: | International networks: | National networks: | Local networks: | Internal networks: |
|-------------|-------------------------|--------------------|----------------|-------------------|
| Helsinki 1  | ICLEI, Eurocities, CovM, Energy Cities, CoM, Climate Kick | CNCL, AMC | CP | General |
| Helsinki 2  | Climate Kick | | CP | General |
| Helsinki 3  | Climate Kick, ICLEI, Eurocities | | CP | General |
| Helsinki 4  | CovM, C40 (not as member), ICLEI, Eurocities | | | |
| Madrid 1    | C40, Eurocities, ICLEI, GoM | FEM, RECC | N/A | N/A |
| Madrid 4    | C40, Eurocities | | N/A | N/A |
| Madrid 5    | CIVITAS | | N/A | N/A |
| Stockholm 1 | C40, Eurocities, ICLEI, Polis, CNCA | SKL | SK | Specific topics |
| Stockholm 2 | C40, Eurocities, ICLEI (+ CDI), CNCA, CoM, CovM | FFFSI (partly) | | Specific topics |
| Stockholm 3 | Eurocities, C40 | KK, FFFSI | SK | Specific topics |
| Stockholm 5 | C40, Eurocities | KK (partly) | SK | Specific topics |
| Stockholm 6 | C40, Eurocities, CNCA, Climate Kick (semi) | FFFSI, KK (semi) | SK | Specific topics |

Abbreviations: AMC = Association of Municipalities, Climate Campaign; C40 = C40 Cities Climate Leadership Group; CNCA = Carbon Neutral Cities Alliance; CNCL = Climate Network of City Leaders; CoM = Compact of Mayors; CovM = Covenant of Mayors; CP = Climate Partners; FEM = Federación Española de Municipios y Provincias; FFFSI = Fossil Fuel Free Sweden Initiative; GoM = Global Covenant of Mayors for Climate and Energy; KK = Klimatkommunerna; RECC = Red Española de Ciudades por el Clima; SK = Stockholm’s Klimatpakt; SKL = Sverige Kommuner Landstill.
which networks the respondents worked with. The table also shows that in Stockholm, the variety of networking activities was highest, with the lowest in Madrid and Helsinki falling in between.

In Madrid, there was cooperation between the various parts of the city organisation; however, the respondents did not report having a formal network for climate issues. Similarly, the respondents reported there was cooperation between different local actors, especially NGOs, but not in the form of an institutionalised network. In Stockholm, the respondents indicated that they did have an internal network for climate change mitigation within the city organisation, but that they saw it as separate groups organised around the topics of the sub-networks the city was participating in according to C40.

To obtain a more diverse point of view of urban climate governance in the case cities, I identified a few key actors outside of the city organisations and interviewed them. These actors included representatives at the regional level, representatives of the third sector, and representatives of C40. I used the data from these interviews as complementary information, centrally focusing on the respondents from the city organisations. I interviewed twelve city officials and six contacts from other organisations (please see the supplement section 1B).

The interviews were semi-structured (Magnusson and Marecek 2015). The length of an interview was, on average, 54 minutes. The themes varied depending on the role the respondent had in climate mitigation (for details, see supplement, section 1A). I interviewed the respondents face-to-face, except with one interview conducted via Skype video call. Before the interview, I offered the respondents information about the study and processing of data, informing them that the data would be anonymised, but I could publish direct quotes from it. I recorded, transcribed and anonymised all the interviews. I did not include all filler words and sounds in the transcriptions, as they were not relevant for the analysis. I conducted and analysed the interviews in Finnish in Helsinki, Spanish in Madrid, and English in Stockholm.2

I analysed the material using qualitative content analysis, a method developed as a response to the limitations of content analysis as a purely quantitative approach (Kracaueur 1952). In the analysis, the focus was on discerning the meanings that the data contained, and as a result, some features, such as the frequency of certain words, were not considered significant, whereas other rarely mentioned ideas were found to be important in the results (Schreier 2013; Drisko and Maschi 2015).

To build the coding framework, I used the following questions drawn from the main research question:

Why do cities network, and how do they benefit from it? -> code groups: Motivations, Benefits of networking

On which levels do the cities network? -> code group: Level of networking

I further analysed how the benefits were associated with the networks at different levels (see Table 3 in the article and the supplement section 4C).

To determine the networking benefits, I used deductive coding based on the benefits found in earlier literature (see Table 1 in Section 2). This method of coding is not as common as inductive coding in qualitative content analysis, and it is important to critically evaluate whether the codes are appropriate and sufficient for the material (Schreier 2013). However, since these benefits were familiar from the earlier literature, they likely would have affected my reading in any case. Therefore, I used them as the basis of my analysis, evaluating how well they fit with these data. When I came across a motivation not included in the benefits from the previous literature, I coded it inductively based on the material. I also used inductive coding for the levels of networking and cooperation groups.

I grouped the quotes regarding the different benefits under the global level, EU level, national level, local level, and city organisation level based on the level of networking that they were connected with. Sometimes, the quotes did not connect with any special network(s), so I interpreted them as comments on networking in general. To get a rough picture of the presence of each benefit of different networking levels, I collected the grouped codes in Table 3, marking an X if the benefit was in connection to a certain level and 0 if it was not. In qualitative content analysis, the number of mentions is not considered as a measure of the importance of the benefit (Kracauer 1952; Schreier 2013; Drisko and Maschi 2015), and so this information was not reported. I continued by analysing how the benefits were described inside the networking-level groups. Further information about the coding process is contained in sections 2 and 4 of the supplement.
With qualitative coding, subjectivity is always a possible limitation. However, it was impossible in this case to have the material coded by another person. Therefore, I first analysed my field notes and then transcribed the interviews, leaving some months in between to gain a sense of perspective to discern things I might have missed upon first glance. To further increase the reliability and transparency, I offer additional data examples in section 4 of the supplement. The anonymised data set is also available for research purposes upon request. The qualitative analysis based on the interviews conducted in the three cities offered detailed information about the research topic in the analysed cases, but there remain limited possibilities to generalise the findings. However, reflecting on the results of the previous literature and other cases allows for wider conclusions to be drawn.

**Results and Discussion**

Table 3 summarises how the benefits of networking were divided into different levels. Overall, similar benefits were associated with networks at all levels. However, there were differences in terms of which benefits were highlighted and how the benefits were manifested. In what follows, I will provide a more detailed account of each benefit across the networks at different levels.

**Information sharing and learning** were considered important benefits across all networks and at all levels. This is hardly surprising, considering the findings reported in the earlier literature (e.g., Lenhart et al. 2014; Bulkeley and Newell 2015; Bansard et al. 2017; Busch et al. 2018; Mocca 2018; Papin 2020; Karhinen et al. 2021) along with how many networks themselves define their respective roles. Information sharing at the international level (including global and EU networks) was considered especially important. In all three cities, the respondents argued that since their respective city was larger than other cities in the country, they faced different problems than the others. Therefore, they considered sharing thoughts with other big cities in international networks like C40 and CNCA to be important:

> To be able to, to have a network with people you know you can call and discuss any issues you might be having on your table, for now, in another big city, or in another country—that’s very valuable. Sweden is, I mean, we are double or twice the size of the second largest city in Sweden, which means we need to compare our challenges with cities outside Sweden mostly to—for it to be accurate. (Stockholm 2)

However, the respondents highlighted that one could not just pick a solution from another city and implement it. The process was more about getting ideas, combining them, and developing them further to match the local context. There were also criticisms of the role of formalised networks in this process. In particular, Respondent 5 from Madrid questioned whether one even needed to participate in a formalised network to share information. This respondent found that personal contacts in different cities were more useful.

Another aspect of information sharing involves crossing boundaries, either between different parts of a city organisation or between the city organisation and the private sector. In the case of Madrid, there was no city-to-business or other local formalised network according to the respondents. Of course, this does not mean they did not communicate with the private sector. However, communication was reported to be quite limited when it came to climate action:

> Then, well, with certain companies, well, we also have some contact, but it would be good to make it stronger, with the sector, the private sector, and maybe there would, well, be one field more to work in. (Madrid 1)

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**Table 3. Benefits cities gained from different levels of networking, where X = benefit was mentioned in connection with this level at least once; 0 = was not mentioned. The levels on the left refer to the level in which the networks operate, e.g. C40 belongs to global level while the internal climate network of City of Helsinki belongs to city level.**

|        | Branding | Goal setting | Information sharing | Learning | Lobbying & city advocate | Motivation & legitimacy | Networks of individuals | Resources & tools |
|--------|----------|--------------|---------------------|---------|--------------------------|------------------------|------------------------|------------------|
| Global | X        | X            |                     | X       | X                        | X                      | X                      | X                |
| EU     | X        | X            |                     | X       | X                        | X                      | X                      | X                |
| National | 0    | 0            |                     | X       | X                        | 0                      | X                      | X                |
| Local  | X        | X            | X                   | 0       | X                        | X                      | X                      | X                |
| City   | 0        | 0            | X                   | X       | 0                        | X                      | X                      | X                |
When it came to Helsinki and Stockholm, information sharing was considered an important aspect in CBNs. Not only could companies share information about their climate actions, but they also received information about what was happening in their respective city organisations:

> [Then] also the companies get a contact to the city, through us, so if they have some problems, they can contact us, and we will dig it [information] up for them. This organisation of the city is so huge that the people outside of it, they don’t understand it—the huge organisation that, this is. And then it has helped their work as well. If they contact me, or [Helsinki 3] who is in Climate Partners and the one who coordinates it, then we dig up the information for them. Then you can be in contact in the city. Like, we help them. (Helsinki 1)

The respondents found it useful for the city to obtain information about what happened in the companies and the markets they worked in; ‘scanning the market,’ as Respondent 3 from Stockholm put it. Direct contacts were considered valuable.

> [Yes, it has been useful at least for us, that we always, like, know all the contact persons with whom to be in touch if something comes up, something like if we want some companies to be partners in a project and ... or then if we want to ask about something else. (Helsinki 3)

Direct contacts in the private sector were also reported to be helpful when there was a need to form collaborations. However, Respondent 3 from Helsinki highlighted that, in their opinion, one should not expect too much from a CBN. For example, they considered the goal of developing completely ‘novel ways of cooperation between the city and the companies’ as unrealistic and unnecessary.

Resources and tools were also a benefit connected to all levels. At the global level, the respondents mentioned emission calculation and reporting tools, especially related to the Compact of Mayors (CoM), Covenant of Mayors (CovM) and ICLEI. Respondent 5 from Stockholm mentioned that they were developing an emission calculation tool for different goods, such as construction materials, in cooperation with C40.

Support to secure financial resources was also connected to different levels. In the case of global networks, C40 in particular, with their contact at the Bloomberg Philanthropies, was seen as important. Swedish respondents reported that participation in national networks helped them to both apply for funding and to divide costs with other cities. In the case of Helsinki, the climate network inside the city organisation served to combine money from different city departments for funding projects:

> [In the end, you can further quite many things quite a bit when you just find the right people, and then it’s like, okay, we have a couple of thousand, you have a couple of thousand, so, like, let’s put these together. (Helsinki 2)

When it came to goal setting, on the one hand, international networks were reported to affect the goal setting of the city. On the other hand, in some cases, the cities have advanced more rapidly than the networks. Both Helsinki and Stockholm considered that the goals set in CovM were not timely for them anymore. While Bansard et al. (2017) noted that CovM seemed to state more ambitious goals than many members in reality could set, for others, the goals seemed too easy and were not pushing them forward anymore:

> [So now we just, we just stay because it’s a, it’s good will. And ... we continue to report, because that’s what we’re supposed to do, but we don’t, we don’t have to push ourselves to be able to stay within the commitment. (Stockholm 2)

> [Although that Covenant of Mayors took a back seat right away, when we joined it, it did not take long before the city defined stricter commitments than what was required in that Covenant of Mayors. (Helsinki 1)

CovM has been found to be concentrated on goal setting and reporting the results of its members (Papin 2020). The combination of these findings leads to the questions of which cities benefit from membership in CovM and how. However, while one network may have become outdated in this sense, the city might still have used other networks to create the push to work harder. In the case of Stockholm, C40 and especially CNCA were mentioned as such networks.

At the local level, CBNs were intended to create the push forward to accomplish the goals the private companies set. Both networks acknowledged in this study gave the members the liberty to choose their goals and reported that the progress was voluntary. However, the cities asked them to pick those goals that would support the climate strategy of the city. The goals were public, and the company signed off on them with a vice-
benefit solutions, opportunities themselves When – (Busch et al.), mayor 8 the a involvement S – organisations, then we know that their managing director is going to sign this kind of paper with the mayor. (Helsinki 1)

This influence through engaging the company leaders was analogous to the way some city networks, like Global CovM or C40, reportedly promoted climate action through engaging the mayors.

Contrary to the results reported from German cities (Busch et al. 2018), but in line with the findings of Mocca (2017), branding was considered an important benefit in all three cities. This benefit was especially significant at the international level. This may have been due to the size of the cities under consideration, since larger cities may pay more attention to international competition:

And that’s very much about … the politicians. They are very interested that the brand of Stockholm should be that we are a very good city when it comes to climate mitigation and, and, and that we are at the front of this matter. This is very important for politicians. (Stockholm 5)

When it came to the CBNs, the respondents reported that participation in the events of the CBNs provided opportunities for the companies to showcase their solutions, which could also be considered an opportunity for branding. By providing the space and contacts for the companies, the cities branded themselves as business friendly.

Branding was linked to motivation and legitimacy. Networking was also considered to have two levels, the level of politicians and the level of civil servants, as a respondent from Stockholm indicated:

So we have one level involving the political, politicians in city of Stockholm, the mayor of Stockholm. These are organisations where the city executive board is responsible for the membership. So, in Eurocities, we are vice president on the board of Eurocities, with the mayor representing the city, and with the international unit being the executors of the work within the, the city … involvement on the political level. And in C40, there are a lot of initiatives concerning the political level, mayors, vice mayors, mostly mayors, both when it comes to policy, more policy focused, eh, like media activities or outreach, or conferences, stuff like that. And social media, they are active in social media, including politicians from member cities. And then we have another level, which is the civil servant level. The experts within the cities. And here we have a direct exchange of experiences, we develop policies and, and kind of action plans together. We … discuss different challenges for our cities when it comes to the climate, specific climate issues, and also solutions, of course. (Stockholm 2)

Other respondents highlighted that (international) networks were important for getting the mayors and other leading politicians engaged in climate action. This created the support needed to acquire and activate the necessary resources for implementation. Busch et al. (2018) found that this enabling internal mobilisation was the most valued influence of TMN membership in German cities.

However, it is also important to engage the people working in the city organisation across the different departments. In Helsinki, this was one of the main aims of the general internal climate network. It was also considered valuable if the network could at some point offer a way to influence the city council in a bottom-up manner and therefore remove the barriers to implementing certain climate plans.

Branding, motivation, and legitimacy were all connected to lobbying, which was also considered an important benefit of networking. Especially in the case of Stockholm, the results showed that networking was used strategically. On the one hand, Stockholm participated in national networks through which cities could collectively promote their points of view on the state level. On the other hand, one reason the city had been active in Eurocities was this network had lobbied for the city’s point of view in EU-level legislation, which more or less directly defines the national environmental legislation of the member states. Jänicke and Quitzow (2017) found that support from the EU level was important for sub-national actors in countries with less ambitious national climate policies. My results support this finding, adding that such support is also considered relevant when national climate policies are relatively strong and when the sub-national actors are even more ambitious.

In all cities, personal connections were found to be important. Their value was also connected to other benefits, such as information sharing or pooling together resources. Formalised networks were seen
as a good way to build them, not only between cities but also inside the city organisation (in Helsinki) and between the city and business (Helsinki and Stockholm). However, it is important to note that it may be only one or a couple of persons who are actually in contact with a certain network, and for others, that network may be a relatively unknown actor, even when they do work with climate action. For example, in Madrid, Respondent 1 was reported to be mostly in charge of all climate-related networking, and one respondent from Helsinki said that the TMNs affected their work in a way through the official commitments, but that they had no idea what else they actually do. Lack of personal contact is a possible problem in networking. For example, a respondent from Madrid said:

For, because everything, in the end, everything is networking, if [Madrid 3, from C40 office] knows me and I know another person and we have a good relationship and we know each other, everything is going to be so much easier. So then, many times I think the problem is not that the networks do not work well—I’m sure that they all do—but the problem is the distance to those networks. Many times, the pitfall is simply the inability to put a name and a face to a person in that network. Having a contact person already takes you much closer. And if that contact person is inside the municipality and they see each other and have meetings and the person makes an effort and is proactive, then, well, imagine. (Madrid 4)

The same respondent pointed out that, for example, Eurocities was actively in contact with them. However, it had no personnel in Madrid, unlike C40, which had two very active employees. Therefore, C40 received more attention than Eurocities. Similarly, Respondent 6 from Stockholm hoped that CNCA would not grow ‘too much’ since then the connections between members would become less personal:

There is, they are trying to expand, because they have this, this entry ticket of 80 % reduction by 2050, so if there are many cities taking that decision, it could grow, but at the same time I think it’s very, it’s a very good thing to be able to meet with all these 20 people at the same time in one room and have a meeting. Eh, so I hope that it’s not going to grow too much … [laughs] (Stockholm 6)

In future research on city networks, we should pay more attention to the connection at the individual level (Acuto and Ghojeh 2019; Nagel et al. 2019; Davidson et al. 2019B; Mokhles and Davidson 2021). This would contribute to a better understanding of connections between different formal and informal networks, as well as changes in them. For example, if a city relies on only a few personal contacts, it raises questions about the stability of networking, as working positions may change. Another important point of view is the power of individual actors (Davidson et al. 2019B) and the related questions of justice. For more citations about the importance of the individual connections, please see the supplement section 4B.

Regarding those with whom the cities cooperated, the respondents in all cities highlighted the importance of similarity, meaning they prefer to cooperate with cities that have either similar problems or similar contexts. The most important cooperation cities were European, but some were also American, mostly from the USA or Canada. In the case of Helsinki and Stockholm, the Nordic context was important, while in Madrid, some respondents mentioned Latin American cities. Besides personal contacts and similar problems or contexts, similar ambitions were important. The cities from less wealthy countries were almost absent when the respondents listed the cities they cooperated with. In line with the results of learning by Mocca (2018), Respondent 1 from Madrid pictured cities in Northern Europe as the obvious role model for strategies, while the respondents from Stockholm said that their weakness might be a certain lack of humbleness:

Well, always here, well, we look a bit up to North, in the sense that, well, Copenhagen, Helsinki, Stockholm, which already have, goals of well, goals of carbon neutrality with already specified dates … (Madrid 1)

I think we could be a bit more humble to, to say to admit that we don’t have all the answers here. We’re, they might have very good ideas in other cities … aah, that we could bring in. (Stockholm 6)

Overall, these results were in line with previous findings on learning networks (Lee and van de Meene 2012) and general bias in TMNs towards wealthier countries and certain cities in them (Boutiligier 2013; Bansard et al. 2017; Mocca 2018; Heikkinen et al. 2018, 2020). This idea of similarity supports the claim that TMNs seem to replicate rather than create alternatives for policy networks (Bansard et al. 2017). Nevertheless, there was interest in having more direct contacts in cities from less wealthy countries, which was also connected to the idea of offering help for those cities with fewer resources.
Regarding motivations, it was common to see the respondents’ own respective cities serving as (potential) good examples for cities with poorer climate performance. Therefore, networking was seen as a potential way to contribute to a global change. Some respondents also mentioned global responsibility as a motivation for networking, and Respondent 5 from Stockholm brought up the idea that wealthy cities could help those that were less affluent by testing the innovations, since they could carry the financial risks.

In all cities, the respondents noted the need to select which networks the city wanted to participate in due to the large number of options and other workloads. Contrary to the results of Busch et al. (2018), participation was considered meaningful only when it could be active, which meant that the availability of human resources was a limiting factor for networking. Here, respondents seem to put more value on the contacts with other cities and the networking organisations and active information searching and sharing.

Although membership in certain networks was considered good publicity, there were mentions of peer pressure as motivation to join a network. However, at least at the civil servant level, there was little interest in joining networks just to add the logo on the city website. This finding was in line with the results reported for German cities (Busch et al. 2018).

While some benefits and motivations, like information sharing, were similar across the networks and levels, cities seemed to highlight different benefits at different levels. Table 4 summarises the differences between the levels.

Overall, the benefits were similar in the formalised networks at different levels, but the emphasis was different, and not all benefits were present at every level. These results are in line with the previous literature regarding the benefits recognised (see Table 1 in Section 2). Cities can use networks at different levels strategically, influencing national or international (EU) level climate policies through them, and building cooperation locally. This was especially visible in the case of Stockholm. However, this strategic use of networks is not possible for all cities: it requires human, time, and financial resources. Also, it is probably easier for a city that already has certain fame as a climate leader than for some relatively unknown city. Some powerful global networks, like C40, only accept large cities as members. As hubs of political and economic activity, large cities may be in a better position when it comes to influencing their respective national governments. The strategic use of networks may be easier for cities larger than the smaller ones, which could benefit from new types of regional networking (Häußler and Haupt 2021). Hence, defining the characteristics that enable strategic use of networks is an interesting topic for future research with wider data sets than the one used in this study.

Other studies (e.g., Bansard et al. 2017; Heikkinen et al. 2018; Gordon and Johnson 2018) have highlighted that there is still a lack of information on the role of formal networks when it comes to verifiable emission reductions and general climate change mitigation implementation. It may therefore be worth asking whether the nature of benefits prevents a more definitive conclusion from being reached. Many benefits are more connected to planning and political background than to actual implementation. The closer one moves to actual implementation, the harder it seems to distinguish certain variables, such as the impact of an individual network. Similarly, Papin (2020) found TMN governance instrument tools to mainly enable information sharing and establishing norms, while direct action was a practically non-existent feature. However, we also have certain evidence for networks offering direct support such as financial resources, expertise advice, or tailor-made solutions, at least for some members (Heikkinen et al. 2018; Karhinen et al. 2021).

### Table 4. Summary of benefits at different levels.

| Level        | Benefit                                                                 |
|--------------|-------------------------------------------------------------------------|
| Global level | Cooperation with similar cities                                         |
|              | Creating global (= meaningful) change                                   |
|              | Global brands and competition engaging local politicians                |
| EU level     | EU projects                                                             |
|              | Influencing national legislation from the top down through the EU      |
| National level| Influencing national legislation from the bottom up                     |
|              | Cooperation in a similar national context                               |
|              | Spreading information from global networks                             |
| Local level  | Getting the private sector to support the climate goals                |
|              | Creating business opportunities from climate action                    |
| Organisation level | Breaking silos for effective climate action |
|              | Putting together scarce resources                                       |

Rashidi and Patt
(2018) found that networks offering tailor-made policies are the most useful ones. Possibly, we should distinguish between networks that serve as a platform and networks that aim for more direct impact (see also Nielsen & Papin 2020 about separating two generations of TMNs).

As mentioned in the methods section, one important limitation to this kind of small-N case study is the lack of generalisability of the results. The results from my three case cities are largely similar to results gathered from studies in other cities. However, there are also differences, and picking new cases might reveal more of them. Bias to small samples is one limitation of the current urban climate governance literature (van der Heijden 2019), but, small samples allow for gathering more detailed information. Reviewing small sample case studies in a systematic manner should be part of future research on climate-related city networks.

My results support the idea that formalised networks are networks of individuals. Personal connections seem to affect the possibility of using networks strategically. The cities consider building individual connections as a crucial benefit, and networks that can afford direct contact with cities get more attention from them. This insight may have a significant role to play in determining which cities benefit, how, and from what networks, and for understanding the whole ecosystem of the city networks, the need of which Acuto and Leffel (2020) pointed out. Analysing the individual networks inside formalised ones is therefore an interesting challenge for future research.

Conclusions

Typically, networking has been studied at one level of governance, and previous literature has concentrated especially on the role of global city-to-city networks. Instead of continuing this line of inquiry, I turn the lens towards the cities themselves and consider all climate-related networks they work with across multiple scales of social organisation. The main contribution based on this approach is that it complements the previous literature by showing how cities benefit from diverse networking in multiple levels of governance.

My results point towards two main roles that networks have for cities: a political role and a practical role. In the first role, the networks create political support for climate action and strengthen the brand of the city as a climate actor. Cities can use the networks strategically to create support for climate action at different levels of governance. In the second role, the networks offer practical support, such as resources or information exchange, especially through personal one-to-one contacts. In my data, the political role is more visible in international and national networks and less visible in local or organisational networks. However, these results do not show that the political role could not be of importance at these levels. It is possible that in some other cases networks at the local or organisational level would have a stronger political role.

Further research with more data on networks at this level could change the picture. The practical role was also evident at all levels, and at all levels, the formal networks seemed to work through the networks of individuals. This connection between formal and informal networks is an important topic for future research. The possibly central role of individuals opens new questions related to power, justice, and stability in networking.

Notes

1. Another option could be coercion, but often it is not a possibility for subnational actors like cities.
2. I have translated the citations from Helsinki and Madrid presented in Results and discussion. For the original transcriptions, please see the supplement, section 3.
3. At the time, Stockholm held the vice-presidency of the network.
4. For example, the city officials told size of the city was one reason why C40 did not accept the application of Helsinki.

Data availability statement

The anonymised transcriptions of the interviews are available for research purposes upon request. Please contact the author.

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