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The role of City Climate Networks in Promoting Citizen Participation in Municipalities: A Critical Multi-Case Analysis

Mateo Zapata Arango¹, Thomas Hoppe^{1*}, Anatol Itten¹ and Kornelis Blok¹

Abstract

Background At the COP21, cities were recognised as key actors in combatting climate change. In supporting cities, climate city networks such as transnational climate networks (TCNs) and national climate networks (NCNs) have emerged to enable cities in building capacities and formulating climate policy whilst also encouraging citizen engagement and participation in public decision-making. This paper addresses the question whether and how TCN or NCN membership enables municipalities to implement citizen participation in public decision-making. Six propositions are presented addressing: presumed influence of TCN membership on citizen participation, organization of citizen participation, initiator capacity, goal setting, involvement of stakeholders, participatory methods used, and planning processes. A multi-case study research design is used to verify these propositions, comprising of four medium-sized cities in the Netherlands and three in Belgium.

Results Results of the analysis of four cities in The Netherlands show that municipalities having membership to climate city networks only to a low extent empower citizen participation via local climate agendas. Citizen participation emerges rather bottom-up via local initiatives or capacity building via EU framework programs—outside TCNs or NCNs—that better suit financial needs and provide more immediate benefits to municipalities. None of the six propositions were confirmed. A more positive image resulted from the Belgian cases that moderately confirmed four out of six propositions (i.e., organizing citizen participation, goal setting, selection of methods, and planning), and featured indirect empowerment via externally funded implementation projects following firm integration of participation in local climate policy through TCN influence.

Conclusions In terms of citizen participation selected municipalities in the Netherlands having TCN and/or NCN membership only to a small extent differ from those not having membership. This is partly due to poor implementation of TCNs and NCNs—with Covenant of Mayors and 'Klimaatverbond' lacking support structure and capacity—having lost importance during the past years. However, there is reason to believe that context makes a difference as revealed by the cases from Belgium, which revealed more positive results.

Keywords Climate policy, Citizen participation, City climate network, Policy network, Implementation, Energy transition

Background

Non-state and subnational actors, such as industry, cities and regions, play a critical role in helping to achieve the global climate goals. In 2015, at the COP21 in Paris, and more recently in 2021 in the European Green Deal, cities were recognised as key actors in the fight against

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climate change and as leaders in cooperation and innovation in the energy transition [1–3]. Cities' leading potential lies in the ability to combine national with local-level approaches [4]. This results in a multi-level governance system with blurred boundaries between different actors and policy arenas, allowing new actors to become active at different levels and follow multi-level strategies [5]. Actors in this multi-level governance system exert influence on information, expertise, financial resources, organization and legitimacy. The increased interconnectiveness and competencies among these actors allow the subnational actors to increase their representativeness in central policy processes.

Back in 1986 with the Single European Act, the European Union (EU) started to develop into a system of multiple layers or spheres of governance, counting European, national and subnational policy arenas [5, 6]. Authority dispersed across several territorial levels and among a variety of public and private actors, including the allocation of authority to the sub-national level from the national level, as many European countries have been progressively decentralised and local competencies extended [5]. The emergence of climate city networks, and more particularly transnational climate networks (TCN), such as the EU Covenant of Mayors for Climate and Energy (CoM), reflects this multi-level nature and its dynamics [5]. TCNs are defined as international institutions that help cities in taking the lead in climate action and transition to low-carbon economies [7]. In these initiatives, cities and other actors engage in multiple governance activities, such as providing information and networking opportunities to multiple stakeholders, and encouraging the adoption of standards and commitments to decrease Greenhouse Gas (GHG) emissions [8].

Success of TCNs heavily depends on public acceptance, citizens' active participation, and the role that its underlying structure plays in to influence and stimulate action on the ground [9, 10]. Commitment is required by local communities, as well as the ability of cities to find and exploit available instruments to mobilise the finance and governance capacity required to reach the objectives [9]. However, engaging communities to climate actions and fostering citizens to adopt sustainable energy behaviours remains challenging [10, 11]. For example, civil servants are aware of the need and importance to engage the majority of citizenry; however, they often lack the knowledge, experience and capacity to act to engage citizens in climate and energy actions.

Based on the idea that TCNs and other climate city networks—such as national climate networks (NCNs; organised at the country level)—increase the governance capacity of municipalities by engaging them in multiple governing activities, such as providing information

and networking opportunities to multiple stakeholders, it becomes important to understand whether (and to what extent) these climate networks influence citizen participation processes for the better. Whilst this seems to be necessary, currently not much research exists in this research domain. Most studies on TCNs are limited to analysing planning and policy formulation of climate policies and the influence these networks have on them, but less on actual implementation and related local issues, such as citizen participation, co-creation or co-production.

Therefore, this study is meant to contribute to a deeper understanding of the influence of trans-national and other climate networks on citizen participation processes, using the case studies of cities having membership of CoM and/or 'Klimaatverbond' ('Climate Alliance' in English; translation by the authors) in the Netherlands. The country is selected, because it features moderate implementation of a TCN and an NCN. Internationally, it is not a frontrunner in implementing TCNs despite the country having a long history with local climate policy.

This paper addresses the research question: whether and how does TCN or NCN membership enable municipalities to implement citizen participation in public decision-making? The latter applies to the domain of climate change mitigation, and more particularly sustainable energy transitions.

Citizen participation and transnational climate networks

This section provides the theoretical framework used in this study, based on the concepts of local climate policy, citizen participation and climate city networks, such as TCNs.

Local climate policy

Cities have gained attention as key players to combat climate change. This is not only because cities are accountable for 78% of the world's energy consumption and 60% of GHG emissions produced, but also because adaptation and mitigation actions in cities can be successfully implemented [4, 12]. Therefore, activities taken directly by cities can have a large impact in tackling climate change. Local governance, defined by Williams et al. [13], refers to the "political and institutional processes through which decisions are taken and implemented in a subnational geographic level" (i.e., in cities). This decentralisation of power, from central to local governments, advocates a multi-level system of governance in which local climate actions have sufficient space to grow and networks emerge for the diffusion of best practices and collective action [14]. Under this line of reasoning, Palermo et al. [4] argue that the potential of

cities lies in the combination of both national- and local-level approaches to take into consideration features of both realms, and integrate technical and social interests. Moreover, both Williams et al. [13] and Fuhr et al. [15] complement this argument by stating that local governance of cities is better placed to coordinate and develop location-based responses to climate change by enabling decision-making allowing for citizen participation and involving local communities.

Contribution and benefits of citizen participation in local policy making

Citizen participation in local climate action is generally defined as the process in which individuals, groups and organisations are given the chance to take part in decision-making processes that affect them, or on which they have substantive interest [16]. Over the last 30 years, citizen participation at the local level has expanded mainly by three reasons: first, local governments have deliberately tried to offer participatory mechanisms for the expression of citizens' interests, needs and opinions; second, public discontent and disappointment to local government actions have prompted citizens to engage directly in projects to provide services by and for themselves [17]; and third, national legislation has granted citizens more rights to participate in or oppose projects [18]. Therefore, it is important for local governments to create appropriate strategies to allow a durable decision-making, information sharing, meaningful public participation and access of the public to decision-making processes to unlock the benefits of citizen participation [16, 19].

Several authors have focused on presenting information on the benefits and impact of citizen participation to climate actions and policies (see Table 1).

The emergence of social networks amongst citizens refers to the presence of *social capital*. According to Berka and Creamer [22], social capital facilitates the

collective articulation of shared visions and values, fosters the perception of shared identity within the community, and upturns the accessibility of information and knowledge among citizens, making this a key element for citizens to understand current local challenges and build capacity at the local level. When social capital is low or non-existent in local communities, information is less likely to be transferred to others and skills are not communicated or passed on [21]. This becomes important for the success local climate action plans and further engagement of citizens.

Even though the benefits of citizen participation in climate action are fairly well-documented, engaging local communities and fostering citizens to adopt sustainable climate behaviours remains challenging for a number of reasons: limited time and budget resources [19], legal and organisational challenges [25], and poor local government support [26]. According to Scherhauser [19], who investigated citizen participation in four climate change assessments, participation of local communities is rare, and when it occurs, it is only in specific and clearly defined parts of the climate assessment process. In line with these insights, Richard and David [16] believe that local stakeholder participation efforts fail to fully embrace and implement participation. They further argue that local citizen participation mostly occurs in initial stages of policy processes, when an environmental or societal problem is being defined.

Transnational climate networks

TCNs are defined by Busch et al. [7] as transnational institutions that give room for cities to exchange on topics linked to the governance of climate change. Obviously, TCNs have a transnational character enabling interaction between cities from different countries, and having a platform or network management organisation to reach out, inform and enable cities in different countries. According to Kern and Bulkeley [5] TCNs

Table 1 Overview of benefits attributed to citizen participation and their expected impact

	Benefit of citizen participation	Assumed impact and effects	Literature source
1	Contribution to the design and implementation of local climate action plans via deliberation with citizens and stakeholders by building upon their knowledge and understandings of the city	Increased deliberative and substantive quality of selected options, which will lead to formulation of more effective and sustainable local action plans. Increased likelihood for political uptake	[20, 21]
2	Increased acceptability. Less opposition towards the development of renewable energy technologies. Sense of ownership among citizens	Higher overall deployment rates of renewable energy technologies and higher number of climate action activities	[20, 22]
3	Development of knowledge and civil skills to learn about local issues and collective decision-making	Emergence of social networks among citizens arises	[22, 23]
4	Change pre-conceived lifestyle preferences of citizens towards more sustainable behaviour	Unlocking of the required long-lasting adaptive and transformative change of behaviour to tackle climate change	[16, 24]

have three defining characteristics: (1) joining or leaving the network is decided autonomously by a given member city; (2) TCNs are characterised using a form of self-governance; and (3) its members directly implement the decisions and goals taken within the network. Moreover, Busch and Anderberg [27] identify two additional characteristics: (4) TCNs are composed of more than two cities; and (5), TCNs have a certain degree of institutionalisation and formalisation, which means that cities obtain access to rights and, in most cases, obligations (i.e., goals they need to accomplish). TCNs are, therefore, vital components of the structure of the multi-level governance of Europe and its dynamics, connecting different city members to the supranational, national and regional levels. However, in our opinion TCNs are not the only climate networks reaching out to empower municipalities. Climate city networks either have a trans- or international, national or even regional scope. Not all of them are necessarily transnational. In the Netherlands, for example, 'Klimaatverbond' exists which refers to a climate network ran for and by municipalities. Theoretically, the network is coordinated by a network-administrative organisation, with moderate centralised governing power [28]. Therefore, we suggest a classification to climate networks for and through municipalities: (i) transnational climate networks (TCNs), national climate networks (NCNs), and regional climate networks (RCNs). Figure 1 shows how TCNs and NCNs using their agency to influence actors (including their members) at different territorial levels.

Climate city networks enabling municipalities to take up citizen participation

Under the multi-level governance system of TCNs and other climate city networks in this multi-level system may exert influence on the basis of information, expertise, financial resources, or legitimacy. Increased interconnectedness and competencies among the actors allow for more influence of previously peripheral actors (sub-national and non-state actors) on the central government policy agenda. For example, due to increased interconnectedness local communities have become increasingly able to engage in climate mitigation and adaptation policy processes [6, 29].

TCNs are seen as a means to achieve legitimate action, whilst operationalising sustainable development through a system of networks, enabling “opening up” decision-making processes to local politics and local communities [7]. The European Union’s motivates the creation of TCNs for its perceived ability to connect with “grass-roots” communities, bringing the EU, as an institution, closer to communities and people [29, 30].

For example, the CoM acknowledges that involvement of multiple stakeholders is required to developing successful mitigation and adaptation planning. It utilises a “soft governance” approach to engage and persuade municipal authorities to adopt climate planning, policies and actions. In this regard, the CoM requires its members to describe in their climate plans how citizen and other stakeholders are involved during the climate plan elaboration, implementation and follow-up. CoM uses four

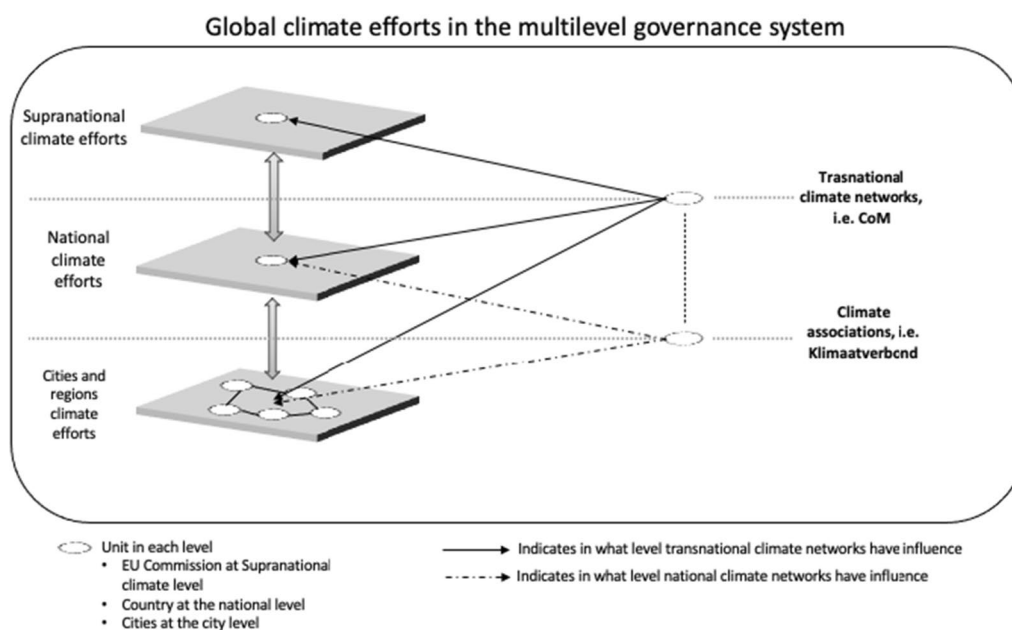


Fig. 1 TCNs and NCNs using their agency to reach agents at multiple levels of governance

levels of engagement: (1) information and education; (2) information and feedback; (3) Involvement and consultation; and (4) extended involvement. To make a successful Sustainable Energy and Climate Action Plan (SECAP), CoM “highly” recommends seeking the highest level of citizen and stakeholder participation [32]. One may argue that what applies to CoM as a TCN in using its agency to stimulate participatory approaches among municipalities may to a certain degree also apply to national or subnational climate networks (albeit lacking the international context and platform to exchange transnational good practice and policy lessons). ‘Klimaatverbond’, a NCN, also acknowledges the importance of citizen participation stating that, “In the coming years, more will be required from residents because (stimulating green) energy transitions means “going into the neighbourhoods” whilst taking actual measures. (Inclusive) Participation at the earliest possible stage is essential in this respect. After all, a sustainable society is created by involving everyone in planning and especially in changes in the personal living environment.” To encourage municipalities to take participatory action ‘Klimaatverbond’ performs surveys and awareness raising actions (paying particular attention to inclusiveness, as to avoid that energy transitions only benefit the privileged), providing good practice examples whilst launching projects with neighbourhood energy ambassadors [33]. These are residents who volunteer to encourage other residents in their residential area of the benefits of sustainable energy and advice and support them to make their homes more sustainable [34].

Citizen participation in climate action: the action arena

To define different meanings of citizen participation in climate action a set of five categories are proposed. These are: initiator capacity, purpose of the participation process, type of stakeholders, methods for citizen participation and stage of citizen participation. These categories result from combining and considering key attributes of the theoretical frameworks by Wilcox [35] and Brody et al. [36] with regard to organising citizen participation processes.

Initiator capacity

Initiator capacity is related to the resources that the local government has available and commits for the citizen participation process. This is described as decision-making, implementation and accountability capacity. Decision-making capacity is defined as the ability of the local government to take well-informed decisions by incorporating new information and balancing different interests. Implementation capacity is the capacity that local governments have to satisfactorily perform their tasks and implement new projects [37]. In local governments

these obligations require financial resources, availability of staff, knowledge and experience [26, 37]. Finally, accountability capacity is defined as how accountable and transparent a local government is in relation to policy it implements. This includes the ability of the local government to appropriately communicate the purpose of the participation process and monitor its progress to the citizens or stakeholders that are participating.

Purpose of the citizen participation process

Defining the right objectives is an important component of a citizen participation activity. If objectives are not defined and clearly transmitted to other stakeholders the process will likely lead to frustration, conflict and disillusion [35]. It is important to have a broad understanding of the motives, intentions and purposes of the local government and citizens for starting and getting involved in participation processes. According to Glass [38] a satisfactory participation process needs to address the interests of both the local government on the one hand and citizens and stakeholders on the other to be considered. A balance between these has to be struck to achieve a positive outcome. Moreover, it is important to consider whether they are realistic or not. The definition of the objective is also important as it influences which stakeholders benefit from the process, influencing, therefore, the level of engagement pursued and commitment of participants [35].

Type of stakeholders

For climate actions and citizen engagement efforts to be effective the initiator should define how many and which type of stakeholder are part of the participation process. The initiator needs to recognise the contributions that each stakeholder makes in the development of climate policies and target these stakeholders with tailored approaches [36]. Moreover, some stakeholders may want or demand to be more involved than others, or other may not want to be involved at all. Therefore, it becomes important for the initiator to identify the different interests and determine the level of participation appropriate for them [35]. Within the local climate action arena there are different types of stakeholders that the initiator can identify and involve in the participation process: (1) businesses; (2) development groups (e.g., social housing organisations); (3) citizens (active or non-active citizens in local climate action); (4) local officers; (5) national bodies; and (6) international bodies (e.g., EU agencies and international NGOs).

Methods for citizen participation

The number and diversity of citizen participation methods are large and growing. The methods used by the

Table 2 Five categories to citizen participation

	Category for citizen participation	Definition	Characteristics	Literature sources
1	To inform	To provide citizens with information to assist them in understanding the problem	- Information flow is one-way - Initiator does not provide mechanisms for citizen involvement - No negotiation between initiator and citizens	[38, 39]
2	Consultation	To obtain feedback from citizens on the analysis, alternatives and/or decisions made by the initiators	- No formal dialogue exists between initiators and citizens - Citizens cannot develop their ideas or participate in the development of climate plans	[38, 39]
3	Involvement	To ensure that citizens opinions, concerns and proposals are considered in the policy making process	- Initiator works directly with the citizens - Citizens' opinions and concerns are reflected in the development of climate action plans	[40]
4	Partnership	To develop alternatives and identify the preferred solution jointly with the citizens	The initiator partners with citizens in the planning and decision-making of climate plans through policy boards and planning committees	[38, 39]
5	Citizen control	To give the final decision-making to the citizens	- Citizens are in full charge of policy and managerial aspects - Citizens convey the conditions under which external stakeholders influence the final outcome - Local government act as an enabler of community-based initiatives	[38, 39]

initiator of the process can affect the degree of success in reaching broader public engagement, constituting an important factor that contributes to the chance that the participation process affects the policy making process and implementation [36]. It is important to distinguish different methods available and select the most appropriate one(s) for engaging citizens based on the objectives of the participation process and level of participation sought. The categories are: to inform, consult, involve, forming a partnership and citizen control (see Table 2).

Stage of citizen participation

Deciding when citizens first become involved in the implementation of climate plans in municipalities, is another key decision that the initiator has to make. For a structured and planned participation process, the initiator has to plan and this process through four different stages: initiation, preparation, participation and

continuation [35]. The initiator first identifies the reason why a participation process should be started (initiation), and then defines the objectives, methods and stakeholders to involve (preparation) to later initiate the citizen participation activities (i.e., participation activity itself). Finally, the initiator ensures monitoring and implementation of outputs from the participation process (continuation).

Propositions

Based on the literature and the idea that TCNs or NCNs increase governance capacity of cities by engaging them in activities, such as providing information and networking opportunities to multiple stakeholders, we formulate six propositions on how TCN or NCN membership influences the ability local administrations have to empower citizen participation (see Table 3).

Table 3 Six propositions on the influence of TCNs and NCNs exercise to encourage citizen participation amongst municipalities

Proposition	Description
P1	TCN and/or NCN membership positively influences the way(s) municipalities organise citizen participation
P2	TCN and/or NCN membership positively influences initiator capacity among municipalities to enable citizen participation
P3	TCN and/or NCN membership positively influences and enables goal setting for citizen participation
P4	TCN and/or NCN membership positively influences the involvement of different types of stakeholders in citizen participation
P5	TCN and/or NCN membership positively influences (the right) selection of citizen participation methods
P6	TCN and/or NCN membership positively influences the structure and planning of participation processes in cities

Research design and methodology

An exploratory yet comparative case study research design is adopted to gain in-depth understanding into whether and how municipalities organise citizen participation in local climate policy, and identify whether transnational (i.e., CoM) or national climate networks (i.e., ‘Klimaatverbond’ in the Netherlands) influence citizen participation efforts in selected signatory cities, in comparison with non-signatories. This research approach allows an empirical inquiry about a phenomenon set within the real-world context when the boundaries of the phenomenon and context are not clearly distinguished [41]. It aims to produce deep understanding of the phenomenon [42]. The geographical research scope is limited to the Netherlands (four case studies of cities) and Belgium (three case study of cities).

Having multiple case studies calls for an effort to explore variety, and to identify similarities, differences and patterns as to understand whether and how municipalities that have membership of a TCN or NCN enable citizens to participate public decision making—on local climate plans—against cities that have not. A comparative method to multi-case analysis is used to systematically analyse commonalities and differences in events, activities and processes [43]. In addition, it enables the delineation of the mix of factors that may contribute to the result of the phenomena, seek and build an explanation on why a case is different or the same as other, helps in articulating concepts, hypotheses, or constructing theories (Ibid.).

Case selection

In the present study cities are the unit of analysis. Cities in the Netherlands were selected, because the country has a long history with climate policy, climate networks, and contains both a TCN and NCN. In this research CoM (a TCN) and ‘Klimaatverbond’ (a NCN) are the climate city networks. Case selection was based on climate city network membership and on size (medium-sized in terms of number of inhabitants).

CoM concerns a movement that brings together more than 11,000 municipalities of all sizes making it the largest city network in Europe, comprising both small and large-sized cities [44]. CoM satisfies the characteristics of a TCN described in “[Transnational climate networks](#)”, where member cities are autonomous to decide whether to join or leave the network, and its members directly implement the decisions and goals taken within the network. CoM specifically focuses on and acknowledges the role of citizens in climate action in its guidelines for creating a SECAP [32]. It is open to all local authorities, independent of their size and in any implementation

stage of climate and energy policies. By January 2022, CoM registered 10,864 signatory cities across Europe, covering more than 307 million inhabitants in over 60 countries. Signatories are mainly small and medium-sized municipalities (with less than 50,000 inhabitants’ cities) representing 89% of the total number of signatory members. However, most of the citizens represented in the CoM live in large urban centres, i.e., with population greater than 250,000 inhabitants [45]. The large majority of signatories (71.5%) are located in only two countries, in Italy (45.6%) and Spain (25.9%) [44]. By 2023 CoM had 36 signatories in the Netherlands. That is 10.5% out of all municipalities in the country (342) [46].

NCN ‘Klimaatverbond’ is a national climate association consisting of municipalities, provinces and water boards, with the aim to actively work and impact policy at the local, regional, national and international level [47]. By selecting ‘Klimaatverbond’ next to CoM we aim to compare and explore the differences between an NCN and a TCN in terms of influence to local climate action, and the interaction between these two networks. This is based on an argument by Kern [1] who claims that national policy networks may be even more important than TCNs in climate action because of the high representativeness of small and medium cities to the national and regional governments. ‘Klimaatverbond’ is open to all Dutch regional and local authorities, independent of their size. By 2023, there were 150 members, including water boards, provinces and municipalities [47]. This means that around 40% of the Dutch municipalities are members of ‘Klimaatverbond’. Even though the association is based on a paid membership by members, the association also works with non-members to support them in their climate policy (R10, personal communication, 2021). The number of active members in the network is about “20 to 30” municipalities (R10, personal communication, 2021). See [Appendix A](#) for more information on CoM and ‘Klimaatverbond’. Background information on the governance and policy history and context in which CoM and ‘Klimaatverbond’ operate in the Netherlands is presented in [Appendix B](#).

Within the Netherlands four medium-sized cities—with population size between 40,000 and 200,000 inhabitants—are studied: two municipalities that are signatories of both the CoM and ‘Klimaatverbond’, one municipality that is signatory of (only) ‘Klimaatverbond’, and one municipality that is neither signatory of any of these city networks. Medium-sized cities were selected for reason of representativeness with most cities in the country being classified as ‘small or medium-sized’. However, academic literature pays more attention to (front running) large-sized cities, more particularly in the TCN literature [26].

For CoM, the cities of Alkmaar and Breda were selected, as they are also members of ‘Klimaatverbond’ and have submitted a climate action plan to the CoM. The latter criterion is used with the purpose of selecting signatories that have shown an initial commitment to the CoM. Based on size similarity, the cities of Middelburg (with ‘Klimaatverbond’ membership) and Westland (no membership to either of these climate city networks) were selected. A more detailed overview of background information of these four cities is presented in [Appendix C](#).

Finally, to search for additional insights that would possibly contrast and validate those found in the Dutch municipalities, three Belgian cities were selected: Bruges, Leuven and Mechelen. All three are medium-sized cities and are CoM signatories. In Belgium, CoM has a large network with 524 city members, 23 coordinators and 25 supporters who are expected to provide more resources and capacity to implement the CoM within the country (and as compared to the Netherlands) [48]. The three selected cities have adopted CoM as a tool to guide their local climate policy and actions, transposing their SECAPs into local climate action plans.

Data collection

In this study, mainly qualitative data were collected. This concerned municipal documents and eighteen semi-structured interviews. These are used in combination as a means of triangulation. By triangulating data, credibility of observed phenomena and patterns increases through convergence of evidence which may also reduce potential biases [49].

Municipal text documents

Desk research was performed into municipal climate policy documents and documentation on CoM and ‘Klimaatverbond’. Additional information regarding local energy community collectives and interdepartmental work are also searched. Whilst there is information available in each municipal climate document many documents were found to have different titles and intentions. For example, municipalities use the terms ‘plan’, ‘programme’ or ‘vision’ to describe their climate documents. It is important, therefore, to define each of these terms to elucidate the level of detail and climate policy progress in each of the municipalities. Boehnke et al. [50] propose definitions for each of these terms (see [Appendix E](#)). In the present study, municipal climate policy documents are collected and categorised using these definitions.

Semi-structured interviews

In addition to collecting text documents, semi-structured interviews were performed in 2021 with municipal civil servants, energy champions within municipalities,

representatives from the CoM office in Brussels, a representative of the Rijkswaterstaat (“Directorate-General for Public Works and Water Management”, in English)—which is the CoM Coordinator in the Netherlands—and a representative of ‘Klimaatverbond’. The purpose of the semi-structured interviews was to explore non-documented information and obtain first-hand data on this topic, reflecting the theoretical concepts found in the academic and grey literature. Interviewees from the municipalities (i.e., civil servants) were selected and approached based on their work in relation to the implementation of climate actions or projects, or involvement in participation processes. Interviewees characterised as “energy champions”, are citizens that voluntarily participate in climate projects within the municipality, namely, active citizens within the sustainable energy transition. Personnel from CoM, ‘Rijkswaterstaat’ and ‘Klimaatverbond’ were interviewed, because they are part of the structure of CoM. In total eighteen persons were interviewed (see [Appendix D](#)).

Data analysis

Data analysis within case studies

Qualitative data were systematically analysed and classified into different categories to assess how citizen engagement is organised. Organising citizen engagement concepts in descriptive categories allows for an evaluation of their inter-relationships by means of analytical steps, enabling the explanation of the object of study. An axial coding strategy was used for this analysis, as it allows for the organisation and grouping of similarly coded data into categories [50, 51]. The codes used reflect the categories and sub-categories developed in the theoretical framework and propositions presented in “[Citizen participation and Transnational climate networks](#)”: “initiator capacity”, “purpose of the participation process”, “stage of involvement”, “methods for citizen participation” and “type of stakeholder”. Within each of these categories, codes are again created to give meaning and explanation to each category. These data are later reflected on critically over repeated cycles of interpretation built upon the theoretical background presented in the previous sections. Particular attention is paid to analysing how CoM and ‘Klimaatverbond’ use their agency to encourage municipal administrations to implement citizen participation strategy and actions (see also “[Climate city networks enabling municipalities to take up citizen participation](#)” on how this is addressed theoretically). In the research this was addressed by raising questions on this matter in semi-structured interviews, and coding relevant information from interview transcripts and other relevant text documents that were collected. For example, by highlighting instrumentation, such as provision

of information and education, information and feedback; involvement and consultation, or extended involvement.

Data analysis: comparing case studies

After the analysis and reflection of each of the case studies, similarities and differences are studied to determine the influence city networks have on citizen participation. The case studies are organised and grouped according to their membership to the CoM and/or 'Klimaatverbond', and then compared and analysed to reflect on the six propositions presented at the end of "Propositions" through repeated cycles of interpretation to identify commonalities, differences, and patterns [52].

Results

Multi-case analysis

In Table 4, an overview is presented of citizen participation aspects for the four Dutch cases. The multi-case analysis revealed six key results. First, the analysis shows that TCN or NCN membership of the four municipalities does not influence participation processes, and neither does it influence climate change policy or action. This is because both CoM and 'Klimaatverbond' were found hardly being implemented nor (i.e., their services) actively used. This can be attributed to the fact that Dutch municipalities have adhered to the two climate networks based on an objective that limits internal implementation of the latter (i.e., confirming climate goals against the international community). Second, the municipalities are experiencing problems related to lack of financial resources and staff. To implement climate policy and actions the municipalities are heavily depending on external resources from the national government or the EU to expand the working force and implement new projects, as they would need to "double or triple the budget" in the coming years to make neighbourhoods more sustainable (R5, personal communication, 2021). Third, strong collaboration with other stakeholders (e.g., local governments in proximity at the regional level) is sought by the municipalities to increase their governing capacity [37], by other means—i.e., outside CoM and 'Klimaatverbond'. Fourth, public participation was only observed at the lower levels of Arnstein's Ladder: i.e., with municipalities informing or consulting citizens and local stakeholders. Involvement of local government with citizen action actually was only observed in the Breda case with 'BRES' (an energy cooperative) actively collaborating with the municipality to implement (and hence 'co-produce') some of the city's climate actions, amongst others to engage residents. However, in none of the cases observations were made of citizen collectives (i.e., energy cooperatives) being called up upon by the municipality or being invited to participate in and influence local climate

policy making, portraying municipalities that, "do not really listen to their people" (R6, personal communication, 2021). Therefore, no observations confirming "citizen control" were made. This is in line with results from a 2019 survey performed by 'Klimaatverbond' amongst its signatories (i.e., in majority municipalities) which found that the majority attaches importance to participation but that they are not working actively to adopt participation actions, and do not know how to follow up or how to organise this. They also indicated expecting participation to emerge 'from within citizen groups themselves' [53], which may indicate a rather passive stance from municipalities.

Fifth, knowledge on participation processes in the four case studies was found to be lacking (in some cases more than others). Citizen participation plans—which are key to successful participation—were absent and most of the work was done on a "trial and error" basis. Sixth, citizen collectives such as energy cooperatives were found to play an important role in sharing information and increase awareness about climate action, act as intermediary between different stakeholders (e.g., housing associations) and citizens, implementing sustainable energy projects of their own. However, in the four cases they were not invited to provide input into climate policy making debates of the municipality, and when they did provide input (mostly on their own initiative) they did not get any assurance whether their advice was adopted or not by the municipality. Furthermore, in all four cases it was observed that citizens lack time, financial resources, knowledge, and social cohesiveness to implement climate actions themselves, indicating low degrees of capacity to act and social capacity. One case revealed that "sometimes people are afraid", because they feel that they do not have "any knowledge" about sustainable energy (R1, personal communication, 2021).

Based on the evidence from the case studies the influence of CoM and 'Klimaatverbond' on citizen participation in local climate action is fairly low. This needs nuancing though. In recent years, both CoM and 'Klimaatverbond' have lost importance among the municipalities and in Dutch climate governance in general (as revealed during the expert interviews). In the meanwhile, other initiatives, programs and governance configurations such as NP RES and EU funded projects (i.e., Horizon 2020 and Interreg) have arisen and taken up a more prominent role, partly related to provision of funding to local administrations. The interviews revealed that they are considered more influential than CoM and 'Klimaatverbond' in supporting local governments in climate action and enacting participation processes. On the one hand, for the 'NP RES' ("National Program Regional Energy Strategies" in English; translation by the authors)

Table 4 Results of citizen participation in four Dutch cases

	Alkmaar (NL)	Breda (NL)	Middelburg (NL)	Westland (NL)
Size	109,000	184,000	49,000	110,000
<i>Participation in city climate networks</i>				
Covenant of Mayors	Member	Member	Not member	Not member
Klimaatverbond	Member	Member	Member	Not member
Activity in climate networks				
Covenant of Mayors	Not used	Not used	N/A	N/A
Klimaatverbond	Not used	Minimum use	Minimum use	N/A
Climate goals	No CO2 emissions by 2050	No CO2 emissions by 2044	No CO2 emissions by 2050	95% CO ₂ emission reduction by 2050 (1990 baseline year)
<i>Initiator capacity</i>				
Decision-making	Mild capacity to incorporate the interests of the local debate	High capacity to set higher climate ambitions than the central government	Low urgency in climate action. Scepticism in local communities over the implementation of sustainable energy	Low decision-making capacity. Low urgency in climate action. Unable to use citizens' input
<i>Implementation</i>				
Financial resources	Some capacity to finance climate change policy. Heavily dependent on external sources	Some capacity to finance climate change policy. Heavily dependent on external sources	Limited capacity to finance climate change policy. Heavily dependent on external sources	Limited capacity to finance climate change policy
Availability of staff	5 Civil servants working on climate policy. Strong collaboration with other stakeholders	8–10 Civil servants working on climate policy. Strong collaboration with BRES. Little outsourcing	3 Civil servants actively working on climate policy. Tasks outsourced and strong collaboration with other stakeholders	10 Civil servants working part-time on climate policy
Knowledge	High internal knowledge	Some internal knowledge. Strong support from the Interreg 2 Seas project	Knowledge on citizen participation is low. A lot of knowledge is outsourced	Some knowledge on future climate plans and participation process
Experience	High expertise	High expertise	Some expertise	Low expertise
Accountability	Some degree of information transparency to citizens and other stakeholders	High degree of information transparency to citizens and other stakeholders	Low transparency. Information not easy to be found	Low transparency to citizens due to lack of information
<i>Purpose of participation</i>				
Public body	- Comply with environmental law - Increase acceptability and ownership - Achieve higher support for projects	- Achieve higher support for projects - Exchange information and educate	- Exchange information and educate - Increase ownership and accountability - Improve quality of outcome	- Increase ownership and acceptability
Citizens	- Greater voice and influence in projects	- Greater voice and influence in projects	- Greater voice and influence in projects - Obtain revenue growth	- Greater voice and influence in projects
<i>Type of stakeholders</i>	Involve stakeholders from the supranational, national and city levels	Involve stakeholders from the supranational, national and city levels	Involve stakeholders from the supranational, national and city levels	Involve stakeholders from the national and city levels
<i>Methods for citizen participation</i>	Consult citizens and stakeholders	Involve citizens and stakeholders	Consult citizens and stakeholders	Consult citizens and stakeholders
<i>Participation: stage of involvement</i>	Citizens participate in local climate action. However, no monitoring of citizen activity	Citizens participate in local climate action. However, no monitoring of citizen activity	Limited citizen participation in local climate action	Low citizen participation in local climate action

Table 5 Reviewing the propositions against the results of the multi-case analysis of four Dutch cities

Proposition	Description	Result
P1	TCN and/or NCN membership positively influences the way(s) municipalities organise citizen participation	There is no indication that membership to trans-national and/or national climate networks influences citizen participation processes. The reason for adhering to a TCN and NCN limits internal implementation of the networks (i.e., to confirm the climate goals against the (inter-)national community)
P2	TCN and/or NCN membership positively influences initiator capacity among cities to enable citizen participation	Membership to TCN and/or NCN does not influence improving initiator capacity to enable citizen participation. However, municipalities were found gaining access to finance and knowledge by participating in other networked arrangements or framework programmes (i.e., NP RES, Interreg 2 Seas, Horizon 2020)
P3	TCN and/or NCN membership positively influences goal setting for citizen participation	A TCN and/or NCN does not directly influence municipalities to setting goals for citizen participation. Citizen participation plans are absent
P4	TCN and/or NCN membership positively influences the involvement of different types of stakeholders in citizen participation	There is no evidence that membership to a TCN or NCN directly influences involvement of (different types of) stakeholders. However, collaboration with stakeholders, such as local governments, housing associations and European partners, is sought by the municipalities to increase governing capacity (mainly funding and knowledge) but is not directly linked to a TCN or NCN strategy
P5	TCN and/or NCN membership positively influences (the right) selection of citizen participation methods	Membership to a TCN or NCN does not influence the selection of participation methods. Dutch municipalities do inform, consult and involve citizens; however, citizen control activities are absent, and local administrations do not know how to implement participation methodically (e.g., with NP RES)
P6	TCN and/or NCN membership positively influences the structure and planning of participation processes in cities	Membership to a TCN and/or NCN only influences the structure and planning of participation processes to a limited extent. Knowledge on the latter was largely absent in the four cases. Citizen participation plans were absent; most work is done on a “trial and error” basis

this can be explained by the urgency the program has, and is supported by national government. In addition, the fact that the municipalities in ‘energy regions’ share common challenges (e.g., financial, technical, institutional, interdependency, particularly due to lack of individual capacity to act) prompts them to increase intensity of collaboration. On the other hand, EU funded projects offer municipalities more direct access to external funding than CoM or ‘Klimaatverbond’, making them more interesting for municipalities to join as they contribute to alleviating financial and capacity problems.

The presence of these new framework programs and (networked governance) arrangements such as these makes CoM and ‘Klimaatverbond’ membership less attractive to Dutch municipalities, as there might be a competition for the time and funds municipalities have to formulate and implement local climate actions. Therefore, it is reasonable to argue that a municipality prefers to select the network that offers benefits directly (i.e., with those providing access to financial resources considered the most important and valuable to municipalities). This is illustrated by a statement from an interviewee, “it comes to a point where you have many networks or many choices that you cannot spend so much time on all of them, so you have to make choices on which network or project you value the most” (R5, personal communication, 2021).

When comparing the municipalities and their agency in climate networks (either joining CoM, ‘Klimaatverbond’, or acquiring and implementing EU funded projects, such as Alkmaar, Breda and Middelburg did) against municipalities that do not participate in either of these projects (i.e., Westland), it shows that the former municipalities are more active in citizen participation and climate action than the latter. This is not surprising, because from the start, these municipalities already show greater commitment and ambitions when they decide to participate in these activities, plus the added benefits of joining these networks and projects (e.g., cooperation, knowledge sharing, and access to finance). Table 5 presents the results of the analysis against the six propositions.

Contrasting cases from Belgium

The results of the multi-case analysis of the four cities in the Netherlands present a rather grim picture of the impact TCNs and/or NCNs have on local climate policy and citizen participation. However, this should be seen in perspective against certain institutional, economic and public budgeting conditions that are at play in the Netherlands. This needs nuancing, and therefore, the Dutch case of four cities is mirrored against cases from another

country. They pertain to the Belgian cities of Bruges, Leuven and Mechelen.

Bruges is a medium-sized city in Belgium (119,500 inhabitants), yet major city and capital of the West-Flanders province, CoM signatory, and not far located from the Dutch border. The City of Bruges is an active member of CoM since 2014 motivated by the need to become climate neutral in 2050, to be able to participate in European subsidy projects, and to share experiences with other cities and countries (R7, personal communication, 2021). From this commitment, the guidelines and requirements from the CoM were used as the basis for the creation of the local Energy Plan 2015–2020. The goals of the CoM were adopted by the municipality, and the submission of the SECAP was used to create comprehensive energy plans with an inventory of CO₂ emissions, global visions, and strategy for 2030 and 2050, the strategies to achieve the goals and the participation trajectory.

In Bruges, CoM once implemented and transposed into municipal tasks, exercised a great influence on governing capacity, having an indirect influence on the participation processes. In fact, CoM helped Bruges—despite being only involved in climate policy for a fairly short period when compared to other municipalities—to catch up and even become a climate champion among municipalities in Belgium, with the city becoming one of the CO₂ reduction champions nationwide. [54] With regard to citizen participation in local climate action CoM did not directly influence citizen engagement, but laid the foundation for it. In later projects, like an EU (Interreg 2 Seas) funded project on sustainable heating (2019–2023) there was more focal attention to engaging citizens, adopting citizen-oriented good practices from abroad, organising awareness workshops, and starting co-creation actions with enthusiast citizens in selected neighbourhoods. In contrast to the four Dutch cases, implementation of CoM in Bruges has proven to fare well in disseminating good practice, strengthening local capacity, influencing decision-making, and even to some extent encouraging citizen participation. In sum, the Bruges case confirms three out of six of the propositions (i.e., regarding organising citizen participation, initiator capacity, and goal setting).

To judge whether the pattern observed in the Bruges case is also observed in other Flemish cities, information from two other cities in the region was collected and analysed. The two cities are Mechelen and Leuven, are comparable in size (respectively, 87,000 and 102,000 inhabitants) and urban characteristics, and are CoM signatories. Like Bruges, the City of Mechelen transposed its SECAP into a local action plan, which also contained attention to citizen participation. Development of the climate action plan involved participatory involvement of

citizens in two workshops [55]. In practice, implementation of citizen participation in the climate action plan stressed citizen empowerment in neighbourhoods, which more specifically led to the establishment of energy community ‘Klimaan cvso’ (R16, personal communication, 2023). However, next to this the current relation of CoM to citizen participation is fairly limited, with current forms of participation having a less structural, more incidental character, relating to bottom-up initiatives, EU funded projects (e.g., from the Horizon 2020 and Interreg framework programs)—with, for example, dedicated attention to co-creation in sustainable heat projects and policy making [56]—and spatial regulations that require citizen engagement in neighbourhood renovation projects. Observations show that citizen participation often pertains to workshops, where citizens are informed but do not actually have a say in public decision-making. This is also related to fear public officials have that ideas deriving from citizen participation may interfere with existing policy agendas. Moreover, municipal departments are not always aware about fellow departments engaging citizens in the same neighbourhood, which causes confusion and irritation among residents due to unclear

communication and poorly coordinated counterproductive implementation of actions in neighbourhoods (R16, personal communication, 2023).

The City of Leuven has a socially oriented local government that is determined to contribute to EU climate mitigation goals and projects (R17, personal communication, 2023). In the Flanders region, the City of Leuven has a reputation for paying ample attention to participation, also in the domain of climate and energy transition (R16, personal communication). As compared to other cases presented in this work, the City of Leuven presents a case with CoM more directly influencing citizen participation, focusing on just and fair energy transition whilst addressing vulnerable groups, such as the energy poor. One way to do this is that Leuven and an NGO coordinating local energy transition actions involve citizens in transformative actions considered necessary to achieve the municipality’s goal of climate neutrality by 2050. In this approach it is considered of great importance that citizens partake in any decisions that impact their living conditions and environment. To get citizens involved ‘shared governance tools’ are implemented, such as citizens juries and a General Assembly, where citizens and NGOs

Table 6 Reviewing the propositions against the results of the multi-case analysis of three Belgian cities

Proposition	Description	Result
P1	TCN membership positively influences the way(s) municipalities organise citizen participation	Membership to a TCN influences the way citizen participation is organised. The reason is not only to confirm local climate goals against the (inter-)national community but also to put citizen participation actual on the local policy agenda, with variation between cities (i.e., Leuven and Bruges taking a proactive stance)
P2	TCN membership positively influences initiator capacity among cities to enable citizen participation	Membership to a TCN has some indirect influence on improving initiator capacity to enable citizen participation. The three Belgian cities gained access to finance and knowledge by participating in networked arrangements or framework programmes though (i.e., Interreg 2 Seas, Horizon 2020)
P3	TCN membership positively influences goal setting for citizen participation	Membership of a TCN did influence municipalities to setting qualitative goals for citizen participation to a varying degree, with Leuven being the most obvious example, also addressing citizen participation in its local action plan
P4	TCN membership positively influences the involvement of different types of stakeholders in citizen participation	There is evidence that membership to a TCN directly influences the involvement of different types of stakeholders in city participation. However, this varies across cases with Leuven as the most striking example in a positive sense. Collaboration with other stakeholders (e.g., local governments, condominium associations and European partners) is sought to increase governing capacity (funding and knowledge mainly) and is to some varying degree linked to a TCN strategy
P5	TCN membership positively influences (the right) selection of citizen participation methods	TCN membership does not influence selection of participation methods. Following transposition from SECAPs into local action plans citizen participation is addressed by municipalities, but not in terms of method used. Selection of methods more takes place one EU funded projects commence, or when national government regulations dictate use of a certain method
P6	TCN membership positively influences the structure and planning of participation processes in cities	Membership to a TCN to a fairly moderate extent influences the structure and planning of participation processes. The case of Leuven presents an example of how this works out well

have one-fifth of the votes. In the sustainability mobility project “Straten vol Leuven” a traffic plan was joint conceived by residents and civil servants of the City of Leuven, indicating a democratic basis and social legitimacy [57]. Part of its attention to citizen participation were efforts by the municipality empowering energy communities, which led the latter to start a collaboration with the Flemish energy cooperative Ecopower (with currently over 60,000 members), which in turn spurred the development of the LICHT Leuven energy community project (which later was financed by the EU under the Horizon 2020 framework). This was motivated by the local administration’s desire that citizens are enabled to financially participate in energy communities. Later in 2017 the City of Leuven set-off a collaboration with the Provincial government (Vlaams-Brabant) to start an initiative to have more energy communities initiated in Leuven and its surrounding regional area, also driven by the ambition that energy communities actively contribute to the City of Leuven’s SECAP. Via this support structure the City of Leuven, the provincial government and regional local governments eventually managed to establish four local energy cooperatives, i.e., ECoOB, Druifkracht, NAVITAS Energie en Noordlicht [58].

In terms of CoM encouraging citizen participation the Mechelen and Leuven cases to some extent mirror the Bruges case, with regard to citizen participation being addressed in the local climate action plan, raising

awareness among municipal staff and acquiring additional external funds to run more dedicated projects involving citizen. However, compared to the Mechelen and Bruges cases, in Leuven CoM was more actively transposed into actions supporting various forms of citizen participation. Table 6 presents an overview of results from the three Belgian city cases against the six propositions. Appendix F presents an overview of results from all seven cases (Dutch and Belgian) against the six propositions.

Discussion

The results reveal different reasons for why climate city networks have a hard job in enabling municipalities to take up citizen participation in local climate decision-making (see Table 7). It turns out that this is not only related to the climate city network’s capacity to act, but also to dependencies with municipalities and citizens which were found to be problematic because of the frames they hold and problems they encounter.

Betsill and Bulkeley [59] and Busch et al. [7] have argued that TCNs are important venues for the governance of global environmental issues, as they support cities in taking the lead in climate action and transition to low-carbon economies. However, based on the results of the present study, this premise only holds to a limited extent (i.e., to the Belgian cases but not to the Dutch ones), in particular when focusing on implementation.

Table 7 Classification of reasons per actor contributing to why climate city networks have a hard job in enabling municipalities to take up citizen participation in local climate decision-making

Actor	Reason
Climate city network (TCN or NCN)	- Poorly supported by (national) network coordinator - Lack of funding and capacities. Depending on national government support (i.e., financial) - Stress participation, but not as main domain of action - Are seen by municipalities to serve other purposes like making a pledge to the international community or green city branding - Only exercise ‘soft governance’; lack enforceable, impactful instrumentation
Municipality	- Depend on key persons within the municipal organisation (i.e., civil servants, mayor or alderman) that serve as connection to the climate city network. Prone to these persons leaving which leads to a critical link falling away, leaving the municipality disconnected - Public officials fear that citizen participation decision-making outcomes do not align well with existing policy agendas, and are opposed to adopting far-reaching modes of citizen participation - Indicate viewing participation as being important, but not aware or not working actively to take up participation actions themselves. Not aware about how to facilitate and organise participation - Expect participation to emerge from within residents’ groups themselves - Lacking capacities (e.g., staff, time, knowhow) - Seek to prioritise working in more formal or mandatory structures like ‘energy regions’ or ‘heating transition’ (developing a transition vision heat for local neighbourhoods like all other municipalities in the country do) - Prioritise connecting to structures that satisfy financial needs more directly (e.g., framework programs with national or EU funding)
Citizens	- Familiar with municipalities as public service provider, and not so much as facilitating citizens to get involved with public decision-making - Distrust of municipalities - Active citizens are more familiar with—and prefer organising grassroots citizen action at the local/neighborhood level. This often comes with its own structure, like energy collectives (e.g., energy cooperatives) - Many subgroups of which many are hard to reach (e.g., elderly, minorities). Issue of inclusion - Not much familiar with climate city networks

However, the study sheds light on some important issues. First, one of the reasons for poor adoption of CoM in the Netherlands is because the supporting network of CoM in the country is not functioning well, which is in line with Bulkeley et al. [31] and Kern and Bulkeley [5], who argue that for a well-working city climate network, a (well-working) national structure must be in place. CoM's national coordinator in the Netherlands, the Directorate-General for Public Works and Water Management hardly considers itself as coordinator of the CoM, and the support organisation of 'Klimaatverbond' does not have the sufficient capacity, and in lacks funds to support its network of municipalities in the country. The case of 'Klimaatverbond' is interesting but also concerning. According to Bulkeley et al. [31] and Kern [1], local policy networks at the national level (i.e., NCNs) may be more important than TCNs, and even more important to small and medium-sized cities and towns, as these national networks compensate inadequate capacities of municipalities. However, these premises did not hold for 'Klimaatverbond' in the present study as the services this NCN offers were barely used by municipalities in this research.

Second, and in line with Heikkinen [60] this study found that among the most common reasons for municipalities to join CoM are: to confirm their commitment to climate goals against the international community, and to use CoM for city branding purposes. When compared to the different functions given to why cities opt to join TCNs (as mentioned by Bulkeley et al. [31] and Busch et al. [7]) green city branding is not directly mentioned although the latter is discussed in other literature (i.e., Busch and Anderberg [27]), where results show that some cities are good at presenting themselves as suitable cases, which, however, leads to an over-representation of well-documented "usual suspects" in TCN case study collections [61]. However, it can be argued that public confirmation of climate ambitions can be considered an important issue that determines the commitment to use the TCN within the municipality. Although this can be seen as a valid reason for a city administration for wanting to join the CoM, this should probably not be the only one. If so, it prevents further action and influence, making the network to function as an isolated project. As Karhinen et al. [29] argue, simply joining a climate network and setting ambitious goals do not suffice for triggering change. In the case of Bruges, where CoM membership was widely diffused to the municipality, the network encouraged the municipality setting GHG reduction goals whilst contributing to building capacities to implementing local climate policy. In this case CoM succeeded in offering a functional network, framework,

providing the right knowledge, working methods, and a blueprint structure the local authority could adopt. Moreover, CoM triggered commitment from the City Council and civil servants.

When addressing the agency climate city networks use to enable local governments to encourage citizen participation, the present study reassures what is argued by Bulkeley et al. [31], that it is not clear how people "at the very grassroots" are empowered by these networks to participate in local policy making or influence policy making at the (national or) EU level. On paper, CoM provides recommendations and sets requirements on how to engage citizens, whilst 'Klimaatverbond' supports its members with building a knowledge base, awareness raising, providing good examples and running an energy ambassadors program. However, in the present study on the Dutch cases, actual influence of climate city networks empowering local government to encourage participation was limited, in part due to low capacity to act and interdependencies between the actors (i.e., climate city networks, national government, municipalities and citizens; see Table 6 for the reasons).

Finally, this research shows that engaging local communities into climate actions and fostering citizens to adopt sustainable energy behaviours remains challenging, also for local authorities. This is because of limited availability of time (from both the civil servants or citizens; in line with Scherhauser [19], organisational challenges (insufficient knowhow; in line with Van der Schoor and Scholtens [25], and limited support by the local authorities (obstruction from municipal officials with poor inter-departmental alignments and coordination; in line with Hoppe et al. [26]).

Based on these reflections, we believe that it is more important to understand how TCNs or NCNs are implemented, under which conditions this succeeds, and how many actual city members are using these climate city networks' services rather than evaluating the mere benefits and outputs of these networks. Many studies have addressed TCNs on their planned overall reduction of GHG emissions based on the initiative's size, programs and plans (see, e.g., Salvia et al. [62]), which in itself is good, because it creates expectations among the public on strategies to further reduce GHG emissions. However, if only 25% of the signatories are actually using and implementing TCN (or NCN) frameworks and practices, expectations are based on the wrong premises. Therefore, we wish to raise more scholarly attention to studying actual implementation of climate city networks, how they work through in local decision-making, citizen participation, policy implementation, the implementation process dimension, impact and side effects.

Conclusions

This paper set out with the research question whether and how TCN or NCN membership enables municipalities to implement citizen participation in public decision-making. It was answered by presenting and empirically assessing a set of six propositions. A multi-case research design was adopted using four case studies of Dutch cities. In addition, three contrasting cases from cities in Belgium were analysed.

Results show that the cities analysed in the Netherlands having TCN and/or NCN membership do not compare much different to cities that do not have TCN membership when involving citizens into the climate and sustainability agenda. This is because these climate networks were found being poorly implemented and hardly used, as they lost importance in recent years among cities and in Dutch climate governance. One of the reasons for the poor adoption of CoM in the Netherlands is because its supporting network in the country is not functioning well. CoM's national coordinator, the Directorate-General for Public Works and Water Management hardly considers itself as coordinator of the CoM, and the 'Klimaatverbond' support organisation does not have sufficient capacity, and in particular lacks funds to support the network in the country. Second, cities not only joined CoM to confirm their commitment to climate goals against the international community, but also for city branding reasons. However, arguably public confirmation of climate ambitions can be considered an important issue that determines commitment to implement climate city network frameworks, functionalities and practices within the municipality. Even though this is a valid reason for a city administration for wanting to join a TCN or NCN it prevents further action and influence, which leaves the network to function merely as an isolated project.

Although three out of four of the observed Dutch cities are TCN signatories they were found to actively seek other structures that better suit their needs or are imposed on them. Among those, NP RES and EU funded framework programs (i.e., Horizon 2020 and Interreg) have taken a more important role, and have proven to be more influential than the CoM and Klimaatverbond in supporting local governments in climate action and enacting citizen participation processes. This can be explained as these structures target cities that share common challenges, prompting them to strongly collaborate together whilst offering more direct access to funding, making them more attractive for municipalities to join and actively participate. Moreover, the projects that follow from participation in these structures were also found to encourage citizen participation more actively.

To put the results for the analysed four cities in the Netherlands in perspective three cities in Belgium were

analysed, all of them CoM signatories (i.e., TCN member; i.e., CoM). In contrast to results for the Dutch cities, they present evidence in moderate support to four out of six propositions regarding TCN membership positively influencing: (a) the way(s) municipalities organise citizen participation; (b) goal-setting towards citizen participation; (c) selection of methods supporting citizen participation, and d) the structure and planning of participation processes. For the Dutch cases, results did not provide direct evidence in support of any of these six propositions.

The present study is not without limitations. First, the selection of the Netherlands as the research locus might be problematic, because CoM—as a TCN—has fairly little capacity to act, is adopted by a relatively low number of municipalities, and there is not much of an overarching governing body of the network, in particular when compared to other EU countries, such as Italy (which is considered a front runner). Hence, external validity is moderate at most. It would be interesting how this plays out in conducting a comparative study with a country in which CoM is empowered more thoroughly and uses its agency more effectively. The same holds true for 'Klimaatverbond' as NCN—once a promising initiative of local governments nationwide—suffering from budget cuts, becoming dependent on external funding whilst being less capable to perform its main supportive actions to its members. Second, few academic works were found for NCNs and, in particular regarding 'Klimaatverbond'. This limited the study in the sense that missing information about the functions of this type of networks and working structure were collected from only one source of information, i.e., the interview with the 'Klimaatverbond' representative. Third, the present research focused on medium-sized cities. For future research it is suggested to do additional analysis on smaller-sized cities to determine whether TCNs and/or NCNs exercise even less influence on cities of this size (whilst overemphasizing large and mega-sized cities). Fourth, in terms of citizen participation, lack of knowledge among civil servants was encountered on how to reach and engage citizens that are either not interested or not aware about climate action. It is, therefore, recommended to study what the best method or combination of methods are to engage this group with regard to citizen participation. It is also suggested to focus future research on understanding the implementation process of TCNs comparing successful and less successful cases. This would allow for identifying reasons why these city climate networks succeed or fail to be adopted and used by its members, and come up with good practice or solutions. Future research can also address the structural dimension in a more fine-grained manner and use social network analysis to study network

characteristics, for example, to further understanding into how power is exercised in TCNs and/or NCNs, and how this influences their overall performance. In addition, it is recommended to study the mechanism of how TCNs, NCNs and other networks empower local government to encourage citizen participation in climate action adopting a polycentric governance perspective. This is also driven by a need for research to determine where decisive, impactful decision making takes place and how this compares to other centers where decision making takes place and power is exercised. Finally, it is suggested to replicate the present study in other contexts whilst testing and elaborating the six propositions central to the present study.

Based on the results of the present study, recommendations can be given for climate city networks, city councils and civil servants. For climate city networks in the Netherlands it is recommended to engage and include supportive local stakeholders who are knowledgeable and understand citizens' needs, and are in close social proximity to them. Although most municipalities are generally aware of the need to involve citizens in their climate projects, they are not always aware about citizens' interests and how to effectively engage them. By doing this, the network itself is strengthened locally and participation processes can become more effective. For the City Council members and civil servants, it is recommended to clarify how inputs from citizens can be used or even adopted when formulating local climate policies. This could increase transparency, and ensure citizens that their inputs are taken serious by municipal policy makers and are considered for adoption in policy making. In the end, greater confidence in the process is achieved, making a first step to increase citizen participation levels. It is further recommended that municipalities strengthen co-operation with local energy cooperatives to have more effective and participation processes with a greater level of trust and legitimacy. Successful co-operation (or co-production for that matter) may even alleviate the financial and staff pressures that municipalities face. However, this may be difficult in practice, because climate networks are often tight on staff base with precarious funding. A potential alternative to this could be developing strategic partnership at a higher level of aggregation with, for example, 'Energy Cities' (a network of over 1000 municipalities in 30 countries addressing sustainable energy transitions [63]) or CoM forming a strategic partnership with REScoop.eu, aiming to acquire Interreg or Horizon Europe funding to facilitate and implement participatory actions in selected cities that serve either as pilots or replication sites. As a way to better support the work of climate city networks in the Netherlands it is recommended that municipalities involve

multiple of their inter-organisational departments when adhering to a climate city network. This could improve internal involvement, alignment and coordination, and ensue commitment and compliance to a climate city network for a period of time. Finally, it is suggested that the EU and national governments make more budget available to empower TCNs and NCNs, respectively, in building capacities and keeping them on an acceptable level, so that these climate city networks have more capacity to act. This would avoid them to end up in a deplorable situation in which these networks are forced to seek for money for running projects, which takes away much of their leadership, capacity and eventually strategic agency.

Appendix A: Background information on CoM and 'Klimaatverbond'

Covenant of Mayors for climate and energy

The CoM, launched in 2008 by the European Commission, is an open initiative to every local or regional government that voluntarily commits to fight climate change. In April 2021, and to step-up the climate ambitions and commitment to deliver tangible action, the CoM set new "2050 targets" to encourage new and current signatories to sign up to a "fairer and climate-neutral" commitment. In this new commitment, local authorities pledged to decrease at least 55% of GHG emissions by 2030 and achieve carbon neutrality by 2050 whilst having more actions towards the engagement of citizens, businesses and government at all levels [64].

The procedure for cities to join the CoM is relatively easy. Initially, the applicant city demonstrates its commitment via a formal decision by the Municipal Council. Then, a city has 2 years to prepare and submit the SECAP, which is the official document that shows how a city will reach its commitment in terms of GHG emissions. After submitting the SECAP, the local government then implements it. The city must submit an implementation report every 2 years to monitor the implementation of the SECAP, and ensure that the city is on the right track to meet its targets or propose appropriate adaptations [9].

Significant human and financial resources are needed to develop and implement a local climate plan. For smaller or less experienced municipalities this can be more challenging than larger ones, as sometimes, smaller cities lack the knowledge, skills and resources to fulfil the requirements [26]. Therefore, when local governments adhere to the CoM, they are supported by a number of entities: the CoM office in Brussels, the European Commission, the Joint Research Centre, the Covenant Coordinators (ministries, regions, provinces, etc.) and Covenant Supporters (energy agencies, association of local authorities, NGOs, etc.) at the national level.

CoM is open to all local authorities, independent of their size and in any implementation stage of climate and energy policies. By January 2022, the CoM registered 10,864 signatory cities across Europe, covering more than 307 million inhabitants in over 60 countries. The signatories are mainly small and medium sized municipalities (with less than 50,000 inhabitants' cities) representing 89% of the total number of signatory members. However, most of the inhabitants represented in the CoM live in large urban centres, i.e., with population greater than 250,000 inhabitants [45]. The large majority of signatories (71.5%) are located in only two countries, in Italy (45.6%) and Spain (25.9%) [44, 44].

Klimaatverbond

'Klimaatverbond' was established in November 1992 with the goal of "promoting a healthy environment" in Dutch municipalities [65]. It was founded by active municipalities who wanted to act in climate issues, as most of the climate initiatives at the time were focused on the national level (R10, personal communication, 2021). It is a network of municipalities, provinces and water boards that work together to anchor, implement and visualize effective local climate policy [66]. The association supports its members, and non-members, in exploring, researching and analysing policy with the aim to optimize current climate policies (Klimaatverbond Nederland, n.d.-a; R10, personal communication, 2021).

The procedure to become a member to the network is based on the City Council or Executive Board decision to join. When the decision is made, the municipality sends a letter with the intention to join the Klimaatverbond, stating the contact details and responsible person within the municipality (Gemeente Middelburg, 2015; R10, personal communication, 2021). From this point, the municipality starts receiving newsletters to participate in the general members' meeting, lobby groups, projects and masterclasses (Gemeente Middelburg, 2015, R10, personal communication, 2021). Klimaatverbond works in collaboration with national, regional and local government, as well as European initiatives to achieve its goals. In terms of finances, the association is financially vulnerable as the fixed income (from membership fees) accounts for only one quarter of the revenues needed for its own projects, making them highly dependent on project-based funds [67].

'Klimaatverbond' is open to all Dutch regional and local authorities, independent of their size. By 2020, there were 174 members: 3 waterboards, 9 provinces and 162 municipalities [68]. Even though the association is based on a paid membership by members, the association also

works with non-members to support them in their climate policy (R10, personal communication, 2021). The number of active members in the network is only "20 to 30" municipalities (R10, personal communication, 2021).

Klimaatverbond as the Covenant of Mayors supporter

The Klimaatverbond is the supporter in the Netherlands for the CoM; however, this role was not fulfilled at the time of the writing of this paper (R10 personal communication, 2021). In 2020, the project between the CoM and the Klimaatverbond was about knowledge sharing and instrument development of a CO₂ pricing system, with the idea to link it to the monitoring instruments of the CoM (Klimaatverbond Nederland, 2020a; R8, personal communication, 2021). The main reason for 'Klimaatverbond' not fulfilling their role as supporter of the CoM, was because the latter did not "really fit with the local situations" of the municipalities (R10, personal communication, 2021). "Cities in the Netherlands already know and do many things", so for them, it does not really make sense to become a member of the CoM (R10, personal communication, 2021).

Appendix B: Background to local environmental policy and governance in the Netherlands

Climate mitigation policy has a long history in the Netherlands. The country was one of the first to develop a national climate policy in the early 1990s to support local climate action, local capacity building and local climate policy making [26, 62]. In 1992, the country signed the Rio de Janeiro Declaration (Agenda 21), signalling the start of discussions on GHG emissions in the country. The Netherlands latest climate commitment came in 2015 when the country signed the Paris Climate Agreement. To comply with the Paris Agreement, the country presented in June 2019 the Dutch National Climate Agreement, which presents the GHG emission reduction goals: reduction of 49% against 1990 carbon emission levels. The goal can be increased to 55% depending on European policy [69].

Local environmental policy—and in a similar vein local climate policy—in the Netherlands has changed over time [70]. As a first point, the issues that local governments work on have broadened embracing sustainable development. Second, the discretionary power of regional and local governments has changed. Local governments have more decision-making power to determine what environmental goals to pursue and how to accomplish them. Third, other decentral and functional governments are also involved, so that local authorities are no longer the only implementing agents of environmental policy. To generate more governing capacity, local governments

collaborate in regional executive public bodies to implement policy. For example, to implement the National Climate Agreement, thirty energy regions in the country are working developing and using a Regional Energy Strategy, with each region being composed of public authorities that work with social partners, network managers (for heating, electricity and gas), business community and where possible, residents to develop regional energy scenarios and pathways to low carbon futures [71].

Appendix C: Background information per case study of selected cities in The Netherlands

Municipality of Alkmaar

Alkmaar is a city that is located at the central-north part of the North-Holland province in the western part of the Netherlands. The municipality has a population of 109,897 and a surface area of 117.35 km², making this the ninth largest city of the province [72]. In 2020, the municipality published the new sustainable program for the period of 2020–2024 named “Innovatief en duurzaam: Programma Duurzaam Alkmaar 2020–2024” (“Innovative and sustainable: Sustainable Alkmaar 2020–2024 program”, in English; translation by the authors). The goals of this program are to emit 25% less CO₂ emissions in 2024 as compared to the 1990 levels and to achieve climate neutrality by the year 2050 [73]. Even though the municipality of Alkmaar does not use the CoM, it is involved in a EU funded (Horizon 2020) project (POCI-TYF), which helps historical cities to become “greener, smarter and more liveable” [74]. In the project actions are related to demonstration, replication and share of knowledge (R4, personal communication, 2021).

In October 2013, the energy cooperative “Alkmaar Energie” was founded by local residents. Its goal was to generate renewable energy from solar panels and wind turbines locally, so that benefits are reaped locally. By 2020 the cooperative had ten volunteers overseeing implementation of its energy projects. They were working on their own time (off working hours), which caused decision-making processes to slow down (R1, personal communication, 2021). In addition, the cooperative did not always have the knowledge and experience to implement projects timely. For example, it could handle one project at a time, but it lacked the capacity to implement two solar roof projects at the same time (R1, personal communication, 2021).

Municipality of Breda

The municipality of Breda is a city in the southern part of the Netherlands, located in the province of North Brabant. It has a population of 184,069 and a surface area of 128.68 km² [75]. In October 2021, the municipality

released the “Breda 2040 Environmental Vision”, which encompassed the “ambitions, goals and assignments” for the physical living environment of the city towards 2040 [76]. In terms of climate goals, the municipality wants to be climate neutral by 2040. In addition, by the end of 2021 the municipality published, a “Heat Transition Vision”, which aims to explain the steps towards a natural gas-free city [77]. Since 2017 the City of Breda works on a EU funded (Interreg 2 Seas) project to encourage private homeowners to make their homes more sustainable by making information options more accessible [78].

Breda is home to the energy cooperative ‘BRES’. By 2020 BRES had around 250 members, and was striving to meet the goal of giving more control to its members over energy supply, by informing and encouraging them to initiate their own projects. The BRES team was composed of sixteen persons, all volunteers who perform different tasks [79]. In addition, the energy cooperative, which trains energy coaches and ambassadors of its own, runs awareness raising activities in local neighbourhoods—including home visits—to incentivize citizens to make their homes more sustainable (R6, personal communication, 2021). Breda is also home to one of the largest solar parks in the Netherlands, which was co-developed and co-owned with citizen collectives.

Municipality of Middelburg

Middelburg is the capital city of the Zeeland province, located in the southwestern part of the Netherlands. The municipality has a population of 48,977 and a surface area of 53.04 km² [72]. For the period from 2019 to 2025, the municipality drafted an environmental vision entitled “Middelburgse Visie Milieu 2019–2025” (“Middelburg Environment Vision 2019–2025”, in English; translation by the authors). The municipality’s main goal is to become energy neutral by 2050 by limiting the energy consumption, increasing the use of energy from renewable sources and efficient use of fossil fuels [80]. In addition, the municipality is drafting a “Heat Transition Vision” to indicate how and when the districts will be free from using natural gas, and participates in an EU funded (Interreg 2Seas) project that aligns to this, but also focuses on citizen participation via co-creation activities [74, 75].

‘Zeeuwind’ is an energy cooperative that operates in the Zeeland province. It has over 2,700 members in all the thirteen municipalities of the province, making it one of the largest energy cooperatives in the country. Its goal is to promote solar, wind and other sorts of sustainable energy among regional residents, business companies, associations and foundations. Additional to promotion, Zeeuwind develops and operates wind and solar parks of their own [81].

Municipality of Westland

The municipality of Westland is located in the western part of the Netherlands, in the province of South Holland. It has a population of 110,375 and a surface area of 90.74 km². By the end of 2019, the municipality published its “Westlandse Energie Opgave” (“Westland Energy Task” in English; translation by the authors), which presents the vision, goals, and strategy of the municipality to achieve 95% CO₂ emissions reduction by 2050 as compared to the 1990 levels. To achieve this target, the municipality is focusing on sustainable heating technologies for the greenhouse horticulture sector, other companies and citizens. For the short and long-term, the municipality will mainly act as enabler and facilitator, within its “statutory duties and limits”. Commitment to sustainable energy is expressed but does not include specified goals [82].

Unlike Alkmaar, Breda and Middelburg, Westland does not have an active local or regional energy cooperative led by citizens. Nonetheless, in October 2019, the cooperative “Venewijk Energie(k) Anders U.A.” was established with the goal of creating a proposal to collectively switch to a natural gas-free heating solution in Westland. A feasibility study was undertaken (yet performed by an external consultancy firm) to arrive at a technical and financial solution to achieve this goal. However, in March 2020, the results of the study proved that a collective solution would be financially inviable. Due to this, the energy cooperative was inactive at the time of the writing of this paper until further developments in the heating transition would open up new opportunities to the energy cooperative [83].

Appendix D: Overview of interviewees

	Organization	Municipality	Title	Date of interview	Code
1	Energy cooperative AlkmaarEnergie	Alkmaar	Board member energy cooperative Alkmaar-Energie	12/05/2021	R1
2	Municipality of Alkmaar	Alkmaar	Advisor sustainability	18/05/2021	R2
3	Municipality of Alkmaar	Alkmaar	Program manager EU project	03/06/2021	R3
4	Municipality of Alkmaar	Alkmaar	Program assistant EU project and sustainability	03/06/2021	R4
5	Municipality of Breda	Breda	Advisor energy transition	01/06/2021	R5

	Organization	Municipality	Title	Date of interview	Code
6	Energy cooperative Bres Breda	Breda	Board member energy cooperative Bres Breda	03/06/2021	R6
7	City of Bruges	Bruges	Coordinator EU project	27/05/2021	R7
8	Covenant of Mayors	–	Overall office coordinator	11/05/2021	R8
9	Covenant of Mayors	–	Reporting, monitoring and evaluation	30/04/2021	R9
10	Klimaatverbond	–	Employee on climate content	28/04/2021 and 17/06/2021	R10
11	Energy cooperative Zeeuwind	Middelburg	Staff member	20/05/2021	R11
12	Municipality of Middelburg	Middelburg	Project leader EU project	17/05/2021	R12
13	Rijkswaterstaat	–	Program advisor	04/05/2021	R13
14	Municipality of Westland	Westland	Energy coach	11/05/2021	R14
15	Municipality of Westland	Westland	Policy worker	10/05/2021	R15
16	City of Mechelen	Mechelen	Climate policy advisor	22/11/2023	R16
17	City of Leuven	Leuven	Energy consultant	04/12/2023	R17
18	Municipality of Westland	Westland	Director	21/05/2021	R18

Appendix E: Definitions

Table: Definitions of municipal climate documents. Adapted from: Boehnke et al. (2019) [50]

Action plan	Document with detailed information about GHG emissions, reduction baseline and target, budget needed, stakeholders to engage, plan for implementation and monitoring strategy
Sustainability strategy	Document with the municipal strategy for sustainability but falls short in more than one items of an action plan
Sustainability vision or program	Document with a general breakdown of targets by sectors to achieve climate goals. Might include milestones, sectoral GHG emissions and energy consumption. Outlines an overall strategy to achieve the targets (not detailed)

Appendix F: Case study finding against propositions

Table: Degree to which hypotheses are confirmed for both the Dutch and Flemish case studies (low = to a low degree; moderate = to a moderate degree; high = to a high degree)

Proposition	Alkmaar (NL)	Breda (NL)	Middelburg (NL)	Westland (NL)	Bruges (BE)	Leuven (BE)	Mechelen (BE)
P1	Low	Low	Low	N/A	Moderate	High	Low
P2	Low	Low	Low	N/A	Low	Moderate	Low
P3	Low	Low	Low	N/A	Moderate	High	Moderate
P4	Low	Low	Low	N/A	Low	Moderate	Low
P5	Low	Low	Low	N/A	Low	Moderate	Moderate
P6	Low	Low	Low	N/A	Moderate	Moderate	Low

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Author contributions

MZA and TH drafted this paper. MZA conducted research (research proposal, data collection, data treatment, data analysis) under supervision of TH, AI and KB. MZA and TH revised this paper following comments by the editor and four reviewers.

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Data availability

Available on request via TU Delft (Data storage Faculty TPM and via: <https://repository.tudelft.nl/islandora/object/uuid%3Ac65b705e-eccb-4297-ae9f-8743a8ac65d5>).

Declarations

Ethics approval and consent to participate

To follow the ethical standards of research, and because of privacy issues, a data ethics and storage plan was made in accordance with the Delft University of Technology guidelines, and those of the Faculty of Technology, Policy and Management. Because of this, all the names of the participants that have been interviewed are anonymized, and only their job position are mentioned.

Consent for publication

Consent for publication of this paper is given by all the authors.

Competing interests

The authors declare no conflict of interest.

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