

**RESEARCH ARTICLE**

# Polycentric urban climate governance: Creating synergies between integrative and interactive governance in Oslo

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**Abstract**

Cities have emerged as important agents and sites in climate governance interventions, experimentations and networks. Drawing upon two strains of climate governance and collaborative governance literature, respectively, this article adopts a polycentric approach to the analysis of Oslo's urban climate governance. It unpacks the relationships between urban leadership, climate goal-setting and institutional design, and reveals how these variables condition the employment of a combination of integrative and interactive governing instruments that foster both self-governance and co-creation in climate responses. The article argues that broad and long-term political support facilitates the adoption of ambitious climate goals, utilization of regulatory powers, and the design and operations of innovative hybrid mixes of integrative and interactive governing instruments. The hybrid combination of instruments is what provides the basis for synergistic, predictable and dynamic forms of self-governance and co-created linkages among public and private 'units' within the wider urban climate governance ecosystem. Trans-local and transnational networks play an important role in building such capacities for urban climate governance. Local processes of co-creation and networked experimentations are 'scaling up' to change policies at city, national and international levels. The empirical observations from Oslo have implication for theories of polycentric urban climate governance and for the promise and limitations of co-creation in the climate arena. The analysis draws upon qualitative interviews with close to 50 public and private stakeholders and policy document studies.

**KEYWORDS**

co-creation, experimentations and scaling, integrative and interactive governance, leadership, polycentric urban climate governance

## 1 | INTRODUCTION

Cities are currently taking the global lead in pursuing goals of resilient, low-carbon, and sustainable urban development (IPCC, 2018; van der Heijden, 2019). To this end, the Paris agreement opened up an increased space of manoeuvre for cities, while also introducing a greater sense of real urgency in implementing appropriate

climate policies. It inspired the search for new opportunities among a diversity of city actors (Bernstein & Hoffmann, 2018; Bulkeley, 2015; IPCC, 2018). Cities often outperform their states and emerge as important sites for climate leadership and experiments with innovative governing instruments (Hofstad and Vedeld, 2020; Bulkeley, Castán Broto, & Edwards, 2015). They frequently break out of traditional local-regional-national hierarchies and act

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in trans-local and transnational city networks or in public-private collaborative arenas (Acuto & Rayner, 2016; Pierre, 2019; van der Heijden, 2018; van der Heijden, 2019). Cities have thus become interesting locations for the study of climate leadership and governance from the local to the global level (van der Heijden, 2018, p. 82, 2019).

However, despite considerable progress, a general problem observed in the empirical literature on how cities lead and govern climate action is the gap between high levels of policy ambitions and the reality of limited activity on the ground (van der Heijden, 2019, p. 2; Bulkeley & Betsill, 2013). Pathways to 'deep decarbonization' and 'climate transformation' understood as a fundamental shift in the structure of political and economic systems seem hard to create (Bernstein & Hoffmann, 2018; Bulkeley, 2013, 2015; Wolfram, van der Heijden, Juhola, & Patterson, 2019). To this end, it remains a challenge in both theory and practice to understand what exactly the governing of climate change in a city entails and how various pathways may be designed and lead to effective, efficient and fair urban climate governance (Hughes, 2017, p. 364). Inspired by these challenges, this article explores the leadership of urban polycentric governance in both theory and practice. *The article aims to unpack relationships between public leadership, climate goal-setting, institutional design, and the employment of a combination of integrative and interactive governing instruments that fosters both self-governance and co-creation of climate responses among stakeholders* (Bulkeley & Betsill, 2013; Bulkeley and Newell 2015; Bulkeley, Castán Broto, & Edwards 2015; Hughes, 2017; Jordan, Huitema, van Asselt, & Forster, 2018; Patterson & Huitema, 2019; van der Heijden, 2018, 2019; Visseren-Hamakers, 2018). By drawing upon experiences in the city of Oslo, the study is set in circumstances in which climate politics increasingly shape local urban agendas and politics.

Cities and the networks and actors they collaborate with can in this regard best be understood as (open) self-governing 'units' within a polycentric system, rather than as a specific domain (Jordan et al., 2018; Ostrom, 2010; van der Heijden, 2018, 2019). *Urban climate governance* is defined in broad terms as 'the ways in which public, private and civil society actors and institutions articulate climate goals, exercise influence and authority, and manage climate planning and implementation processes' (Anguelovski & Carmin, 2011, p. 169). Cities to this end are observed to develop goals, test new institutional arrangements and leadership roles for ensuring policy integration internally and developing and experimenting with climate policies, plans and projects through interactive processes with external actors to advance innovative step changes (Smeds & Acuto, 2018; Acuto & Rayner, 2016; Bulkeley and Castán Broto, 2013; van der Heijden, 2018). Starting from such a broad understanding, we focus on three related topics identified in recent scholarship as central for explaining the role of city leadership in polycentric urban climate governance (building on van der Heijden, 2018, 2019). These topics are subsequently utilized to explain Oslo's public leadership and governance within the larger polycentric regime or 'governance ecosystem' in the climate arena (Gordon, 2018; Hausknot et al., 2018; Held & Roger, 2018).

First, goal-setting is central to enhance the efficiency and effectiveness of any public policy and governance strategy (Latham & Locke, 2006, p. 332). Cities are observed, in Oslo as elsewhere, to often set higher climate goals and ambitions than the nation states they are in (Reckien et al., 2014; van der Heijden, 2018, p. 82). We explore the processes of climate goal-setting in the context of Oslo and reveal how goals are utilized to frame climate strategies and mobilize both internal and external actors to the city administration for shared climate governance.

Second, despite observed achievements in responding to climate change at policy level, many cities show limited capability in internalizing and actually operationalizing climate policies into concrete pathways to decarbonization (van der Heijden, 2019). They rather prioritize other important or acute policy concerns (Bernstein & Hoffmann, 2018; Hickmann & Stehle, 2019; Lafferty & Hovden, 2003; Patterson, de Voogt, & Sapiains, 2019). Intrigued by these observations, we study how the city government integrates ambitious climate goals into own governance, strategies and instruments to promote coherent and coordinated climate action across departments, sectors and actors.

Third, any policy or governance system that tries to improve levels of collective climate action is dependent on the willing cooperation of citizens and private firms and a certain level of trust by the participants that others are (also) complying with the adopted goals and policies (Ostrom, 2010, p. 551; Visseren-Hamakers, 2018; Kern, 2019; Bulkeley & Betsill, 2013). We are thus interested in how cities enable or engage in interactive and collaborative arenas to overcome barriers to boost synergistic urban governance performance and linkages within the broader polycentric regime; climate challenges being perceived to raise a nexus of unruly or 'wicked' collective action problems across a wide variety of actors and scales (Hofstad & Torfing, 2017). Specifically, how do patterns of networking shape 'governance experimentations' and 'scaling'. Experimentation has become a mainstream strategy by many cities to test innovative policies or technologies on the ground (Smeds & Acuto, 2018; van der Heijden, 2019; Gordon, 2018; Bulkeley et al., 2015; Bulkeley & Castán Broto, 2013).

The article proceeds as follows. First, we outline the analytical framework. Second, we present the methodological approach and Oslo as our empirical case. Third, we present the key elements of the 'Oslo urban climate governance approach' and explore how the emerging urban climate governance relates to key research questions. Fourth, we outline the implications of the empirical findings for theory and policy and polycentric urban climate governance. Finally, we conclude and suggest areas for further research.

## 2 | ANALYTICAL FRAMEWORK: A POLYCENTRIC AND MULTILEVEL APPROACH TO URBAN CLIMATE GOVERNANCE

Our adopted framework for studying polycentric urban governance allows us to bridge two key strains of literature:

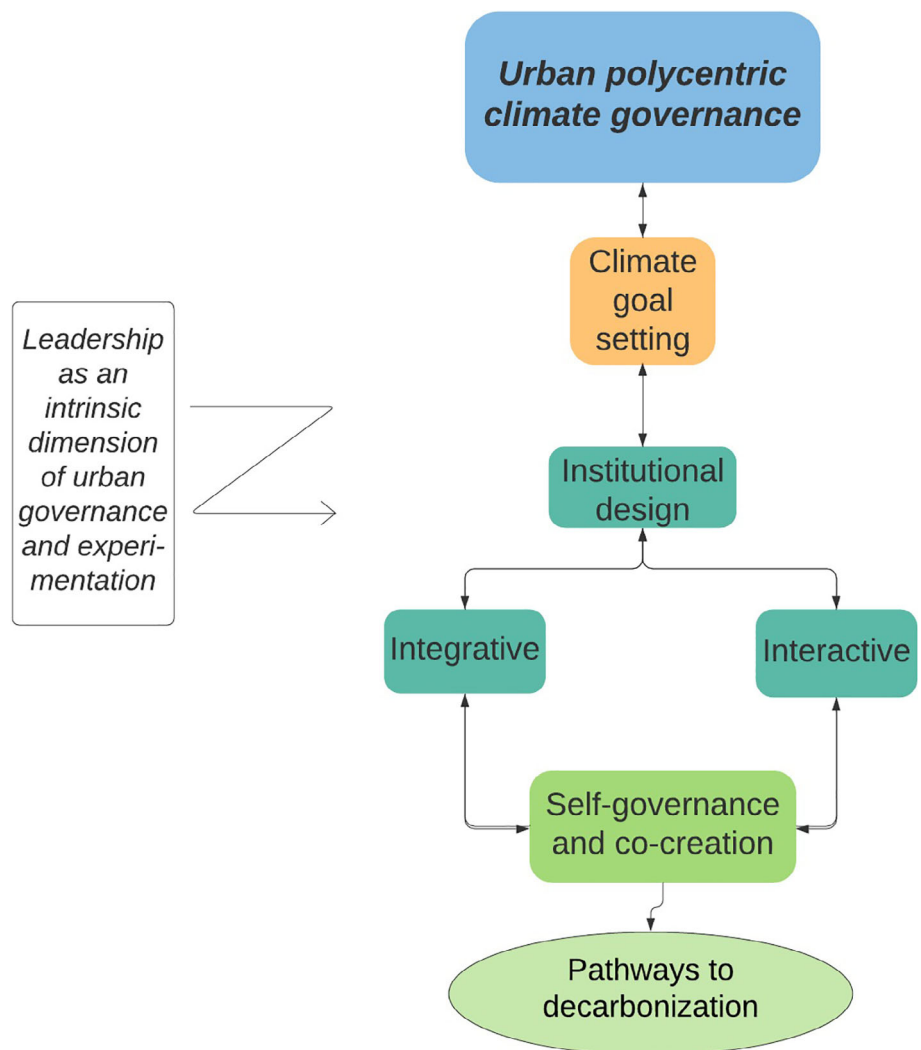
*Urban climate governance scholarship*; highlighting the key role of cities in public climate governance with a main focus on integrative

dimensions and analysing how different forms of governing and instruments contribute to internal policy mainstreaming horizontally and vertically (in multilevel approaches). This scholarship rests to a large degree on earlier insights from the literature on environmental and climate policy integration (Agenda 21) focusing on mainstreaming within the local government in non-environmental sectors, and how the state constrains local environmental policies (Adelle & Russel, 2013; Lafferty & Hovden, 2003; Visseren-Hamakers, 2018; Wang, Van Wart, & Lebrede, 2014). Beyond a focus on how climate change is institutionalized in policies and municipal planning, there is a specific and strengthened focus on how pilots and experimentations evolve to create innovative and transformative pathways to urban climate governance (van der Heijden, 2019; Díaz-Pont, 2020; Hofstad and Vedeld, 2020; Smedby, 2019; Patterson et al., 2019; Smeds & Acuto, 2018; Gordon, 2018; Held & Roger, 2018; Hoelschera, Franzeskakaia, McPhearson, & Loorbach, 2019; Jordan et al., 2018; Kern, 2019; Bulkeley & Newell, 2015; Bulkeley & Betsill, 2013; Bulkeley, 2013; Bernstein & Hoffmann, 2018).

*Collaborative governance and public administration literature*; contributing an actor- and institutional oriented perspective on (urban)

governance. This literature highlights especially the need for interactive governance and collaborative efforts across public and private stakeholders in the co-governance of climate change as a complex problem (Ansell & Torfing, 2016; Pestoff, 2018; Torfing, Sørensen, & Røiseland, 2016; Weber & Khademan, 2008). The literature suggests how institutions design and leadership facilitate collaborative arenas and platforms and how co-creation processes unfold and are managed to spur innovation and/or public value and, in turn, enable improved self-governance (Ansell & Gash, 2007, 2018; Hood, 2007; Osborne, Radnor, & Stokosch, 2016; Ostrom, 2010; Sørensen & Triantafillou, 2009).

Figure 1 illustrates the analytical framework and provides at the same time a visual representation of our findings. Our basic hypothesis is that urban (polycentric) climate governance evolves through a fine-tuned and balanced combination of instruments and forms of governing facilitated by experimental urban leadership. Leadership is performed through climate goal-setting and institutional design of a mix of integrative and interactive forms of governing and instruments. In turn, these processes enable a combination of voluntary self-governance and engagement in co-creation among both public



**FIGURE 1** Leadership of polycentric urban climate governance [Color figure can be viewed at [wileyonlinelibrary.com](http://wileyonlinelibrary.com)]



entities and private organizations. Integrative and interactive forms of governing are treated as the core of our analytical model, with leadership, goal-setting and institutional design represented as either critical contributions to or context variables for the integrative and interactive processes (inspired by Ansell & Gash, 2007). Process outcomes and policy outcomes are in the form of innovations and pathways to decarbonization and/or climate transformation as well as potential feedback to change urban governance, policy and institutions.

*Leadership* is the authority and mindset to mobilize others for a shared purpose by facilitating action and interaction (Sørensen & Torfing, 2019). It provides the essential mediation and facilitation for diverse forms of urban governance. Leadership acts through a combination of 'hands off' orchestration or meta-governance of the overall polycentric system, including in institutional design, and 'hands on' everyday leadership functions in different organizations. Leadership convenes, facilitates and catalyses collaboration through face-to-face interaction and trust building (Ansell & Gash, 2007; Weber & Khademian, 2008). *Leadership of networked experimentation* requires mindsets as collaborative capacity builders and commitment to the collaborative process to bring out the attributes of co-creation. It requires capabilities to enable and work as brokers transgressing institutional silos and boundaries. *Networked or co-created experimentations* are pilots or testing of innovative technologies and policies on the ground; often associated with complex patterns of city networking (Smeds and Acuto, 2018; Bulkeley et al., 2015).

*Climate goal-setting* indicates what the organization wish to attain, usually within a specified period of time (Latham & Locke, 2006, p. 332). Goal-setting and how it relates to the institutionalization of climate policies in cities is an important, albeit overlooked, political phenomenon in the city climate governance literature (Hofstad, Tønnessen, Millstein, Vedeld, & Hansen, 2021). Goal-oriented courses of action (goal-setting) to deal with a complex or significant public problem is, however, a central performance proficiency dimension of any public policy and governance strategy. Moving beyond the public administration scholarship's preoccupation with how public leaders, through goal-setting, succeed in motivating internal employees to act, in studies of *urban climate governance*, the climate goals need to constitute tools that intrigue and motivate the actions of an array of both internal and external actors (Hofstad et al., 2021).

*Institutional design* is defined as the devising and realization by the leadership of rules, procedures, and organizational structures to enable and constrain behaviour and action and interaction of a given constellation of actors in accord with held values, to achieve desired objectives, or to execute given tasks (inspired by Alexander, 2005, p. 213).

The analytical framework suggests two main forms of urban climate governance are required to resolve social dilemmas inherent in climate change (Ostrom, 2010). First, **integrative governance**, which directs attention to the need to integrate/mainstream and anchor shared climate responses of diverse policies and instruments across multiple internal municipal (sector) entities of the wider organization, both horizontally and vertically (van der Heijden, 2019; Visseren-Hamakers, 2018). For a city government, this relates foremost to the challenges of building in-house coordination capacity across sector

silos. This may be done through establishing, for example, dedicated institutional agencies or cross-sector working groups and arenas for mobilizing and aligning diverse staff and entities for shared goals and visions (van der Heijden, 2019). It may also involve upward/multilevel negotiation with state and regional entities to obtain or alter devolved and decentred mandates and authority and organizational capabilities to manage own estate and infrastructures (Kern, 2019). Moreover, the design of *regulatory instruments* may be employed to enhance the authority and internal alignments through commonly agreed rules, regulations, plans, and climate-related services. Second, **interactive governance**, which directs attention to the need for largely autonomous, yet interdependent, public and/or private actors or 'units' at different scales to come together within the polycentric 'system'. The intent is to share ideas and scarce resources, agree on climate goals, ensure carbon control, build resilience and manage complex, social dilemmas and equity conflicts through collective efforts (Ansell & Gash, 2018; Hofstad & Torfing, 2017). Interactive governance relates closely to concepts such as collaborative governance (co-governance), co-creation, participatory governance, and citizen engagement and participation (Torfing et al., 2016).

The combination of integrative and interactive governing, in turn, facilitates or enhances both self-governance and co-creation, the quality and mix depending on leadership choices and institutional design. *Self-governance* is defined as non-obligatory or voluntary climate-conscious action among multiple types of actors (Sørensen & Triantafyllou, 2009). The actors buy into the idea and vision of decarbonization and climate transformation by altering their actions and institutions accordingly without being directly instructed to do so. *Co-creation* is a specific form of interaction or collaborative governance between a plethora of public and/or private actors or partners. It implies interactions that lead to coordinated and collaborative processes in diverse projects and experimentations, platforms, arenas, networks or public-private partnerships for shared public or collective purposes (Ansell & Gash, 2018). When done right, co-creation works to enhance the production of public value and continuous innovation and learning; the rationale is that combined collective efforts produce greater value than the sum of benefit streams from what each actor would have produced in isolation (Torfing et al., 2016, p. 8; Ostrom, 2010).

### 3 | METHODOLOGICAL APPROACH

The data material for the Oslo case includes *document studies* of climate-relevant strategies, plans, policies, and steering documents of the city (City of Oslo, 2016a, 2016b, 2017, 2018, 2019a, 2019b, 2019c, 2019d, 2019e, 2020a, 2020b). Document review is combined with 48 *in-depth interviews* in the period 2018–2020. Informants were selected according to the snowball method. They represent high- and medium-level public officials and professionals within the climate domain (23); politicians (5, position and opposition); high-level employees of private businesses (8); representatives of neighbouring municipalities (4); staff of environmental foundations (2); state actors (2); and actors engaged as social entrepreneurs in brokering between private developers and public

agencies and citizens (3, in an idealistic shareholding company). The interviews lasted approximately 1–2 hr, and focussed on the interviewees' impressions and memory regarding diverse leadership, governance and climate action topics. All interviews were audiotaped, transcribed and coded in NVIVO as part of the analysis.

Oslo is a medium-scale globally oriented city with about 700,000 people. The city enjoys a high degree of devolved discretionary powers, institutional capabilities and generous financial support to formulate and act upon own climate policies. The national climate policy framework is in general supportive of Oslo's climate policies, however, not very specific in terms of what should actually be done on the ground and how (Hanssen & Hofstad, 2020; Hofstad, Vedeld, & Tønnessen, 2020). With reference to its award as a European Environmental Capital in 2019, Oslo has become an innovative frontrunner in responding to climate change, and an exemplary climate leader, and the city brands itself as such, along with cities such as Stockholm, Copenhagen, Amsterdam, Freiburg and London (Kern, 2019). Being a partner in the most important transnational climate networks, such as C40 and EUROCITIES, the city influences and is influenced by progressive global climate cities worldwide.<sup>1</sup> Hence, the city is representative of ambitious, front-running cities that take significant innovative actions regarding policy and institutional development of relevance to climate transformation (The Local, 2019). The city was accepted as a member of C40 in 2013, based among others on its advanced congestion charge system, elaborate and integrated public transport system (metro, tram, train, buses), proliferation of electric cars, and innovations in climate governance (Hofstad and Vedeld, 2020; Hofstad et al., 2020; Watts, 2018). Oslo can serve as a case study to understand urban climate governance in both small-, medium- and large-scale 'global' cities.

## 4 | FINDINGS: THE 'OSLO CLIMATE GOVERNANCE APPROACH'

### 4.1 | Climate-goal setting spurs both integrative and interactive processes

There might be a variety of reasons why the city of Oslo set high mitigation targets – and higher than the national (and EU) level. Van der Heijden (2019) suggests that cities set ambitious goals for a variety of reasons ranging from a wish to tackle 'low-hanging' emission sources, respond to national-level policy demands, to modernize and promote green and smart growth, or as a way of 'branding' the city as 'climate-friendly'. However, first and foremost, our interviews with administrators and politicians in Oslo, suggest that the adoption of the city's visionary and ambitious climate goals represents a manifestation of continuous, strong cross-party political leadership backing for placing climate change high on the political agenda over two decades. The (re-)elected Labour-Left-Green city government recently reinforced the climate goals through adoption of a more accelerated climate response. The city has adopted a relatively clear and targeted climate goal, both short-term and long-term (City of Oslo, 2016a, 2016b, 2018, 2020c);

Reduce greenhouse gas emissions by 95 per cent emission reduction by 2030 (...) and by 65 per cent by 2025 compared to the 2009 level.

These goals stimulate a focus on key sectors and sector-related actors and activities which encompass the largest CO<sub>2</sub> emission reduction potentials, such as transport, energy, buildings, waste, in this sequence (City of Oslo, 2016a, 2016b, 2018). Emissions from energy are less of a concern given that energy for housing is largely produced by hydro-power, and oil heating has been phased out. A characteristic trait of the goal-setting and governing has thus been a certain 'CO<sub>2</sub>-fixation'. This is also observed in other cities and might be interpreted as providing a relatively narrow scope for the climate agenda (Bulkeley, 2015). However, in Oslo, the clarity of the climate emission reduction goals seems to work as a strong governing tool to align both internal municipal entities and the external business community that works to reduce gaps between the goals and implementation on the ground. This is underscored by both representatives of the city (interviewed politicians and administrators) and private business actors (see below). The following quote by one of the key political architects of the climate regime underlines the integrative effects of the goals:

*We needed to have a clear climate goal that could not be manipulated (...) create a governance system that avoids fragmentation (...) and incorporates climate measures into the entire management of the municipality. (Position politician A)*

Compared to many other European cities (Reckien et al., 2014; van der Heijden, 2019), Oslo's climate goals seem to be sufficiently clear to make the goals hard to escape or obscure, while providing for efficient and predictable approaches for relevant and concerned stakeholders (Hofstad et al., 2021). Oslo's latest Climate 2030 strategy and adopted goals are explicit about why and how there is a need to involve an array of relevant and concerned actors and enable both interactive and self-governing arrangements (City of Oslo, 2018, p. 48, 2020c; Hanssen & Hofstad, 2020; Hofstad & Vedeld, 2020).

Moreover, the strategy moves beyond the previous 'CO<sub>2</sub> fixed' goals and has been framed within a wider strategic scope related to the integration of climate adaptation, resilience and broader sustainability concerns in the climate approach (City of Oslo, 2020c). This new strategy was developed with substantive involvement from both business actors and civil society and citizens through collaborative workshops, public hearings and use of social media to foster broad ownership to the approach (cf. Hanssen & Hofstad, 2020; Hofstad et al., 2020; Hofstad & Vedeld, 2020).

### 4.2 | Integrative governance and in-house coordination

The task of securing firm anchorage and delivery of climate goals and responses by integrating them horizontally and vertically within a city



government implies that the city government needs to make the whole municipality – each of the 50 or so entities – responsible for the climate goals and policy (City of Oslo, 2016a, 2019c). Oslo has approached this in several ways.

#### 4.2.1 | Building a climate agency

In order to build in-house coordination capacity and take the climate goals and strategy forward, the city government chose to establish a dedicated, special-purpose *Climate Agency* located relatively close to the Mayor's office with strong mandates and resources to coordinate and act (in 2016). Today it consists of about 30 highly trained and dedicated climate officials and planners that champion the climate cause; many recruited from national-level ministries or from the large environmental NGO sector in Oslo. The Agency's mandate is to be a technical agency, advisor, and driver of coordinated design and implementation of climate measures, such as advising on the climate budget process and undertaking monitoring and follow-up of the reporting and providing support to other agencies (City of Oslo, 2020b).

Besides establishing such an agency, the city utilizes cross-sectoral working groups that bring together public officials from different sectors and professions, based on a needs basis to develop specific sector policies or project experimentations. Input from these working groups has led to refinement of the climate budget and spurred the development of new procurement rules and new urban planning requirements to include climate criteria, as well as an innovative policy on *emission-free construction machinery and sites*, see below (City of Oslo, 2019a, 2019b, 2019c, 2019d, 2019e). The policy packages and accompanying governing instruments emerging from these working groups were formulated with substantive involvement of a variety of private and civic stakeholders, according to interviews with representatives of these sectors.

#### 4.2.2 | Integrative governance through climate budget processes

As a unique innovative governing experiment to pursue the ambitious climate goal, the city government developed a *climate budget* in 2016 consisting of close to 50 climate measures across key sectors representing climate actions and entities within which the city government had some degree of control (some perceived as 'low hanging fruits'): mobility, city planning and the built environment, energy and resources/waste. The climate budget process quickly evolved into the main internal instrument for directing policies and coordinating climate governance across these key different sector departments and entities. Our interviews with both high- and medium-level staff suggest that the climate budget distributes clarity in expectations and responsibilities throughout the city administration, both horizontally and vertically, between front-line employees, administrative leaders and politicians. The climate budget operates as a normal budget managed by the finance department with technical support from the Climate Agency. It

is integrated in the ordinary municipal financial budget as a distinct chapter. Thus, it confers strong internal authority across sector entities. CO<sub>2</sub> emissions from core sector measures are counted and reported upon in the same way as the financial budget accounts for financial allocations. The motivation behind the budget is explained by the City government in the following way (City of Oslo, 2020a: 3):

*The climate budget is a necessary governance tool to allow the implementation of efficient measures so that the target of a 95% emission cut can be reached in 2030. The climate budget represents a commitment for all municipal entities to issue regular reports on the status of execution of the climate measures for which they are responsible.*

As this quote illuminates, the climate budget process helps integrate the city's climate goal into the heart of the municipal climate governance process. Being tied to the financial budget, the climate budget is part of the routinized process of creating, adopting, monitoring and reporting on the budget operations (City of Oslo, 2017). The budget is formally adopted by the city council and integrated into each entity's letters of assignment. This allocates responsibilities for specific CO<sub>2</sub> emission reduction measures. The process facilitates an *anchorage* of the climate goal politically and administratively, as suggested by the following quotes:

*The important thing about the climate budget is that, from a political point of view, you have to consider the connection between the goals you have set and the instruments you plan to use. The system is never allowed to go to sleep. (Administrative leader B)*

*By formalizing the decisions, ... you put a claim downwards in the organization. (Opposition Politician)*

*As a leadership tool, it is impossible for agency directors to ignore. (Administrative leader C)*

Despite these achievements, both leadership and senior officials across different entities and levels report a set of significant barriers for the firm integration of the climate goals and climate budget expectations, indicating that the complete transition of institutional modes of operando across the 50 or so municipal entities of the city administration is demanding and likely to take time:

- Variable or limited anchorage at the top level of several of the climate-relevant sector agencies.
- Lack of climate knowledge competence among key professional personnel across sectors.
- Limited experience with working towards political (climate) goals in operative entities.
- Occasional goal conflicts between an agency's core activities and climate response measures.

Furthermore, key politicians and high- and medium-level administrative staff that were engaged in developing and implementing the climate budget pointed to specific challenges related to the climate budget process itself. These involved: *problems of control over the climate emission agenda*, emanating from the fact that the city government controls only a minor share of the emissions from the city as such; *problems of goal attainment*, as neither available governing instruments nor infrastructure are rigged to accommodate as fast and radical transformation as the climate goal anticipates; and *problems of calculation*, as climate measures are complex and highly connected and it is difficult to estimate the exact emissions for a source as well as the effect of a given climate mitigation measure or response. This complicates the design process, as well as monitoring and reporting on progress. The following quotes underscore these issues:

*When the first climate budget was presented, I was completely baffled, completely, it was a real chore (...) the measurements are quite strange. (Opposition Politician)*

*Climate action measures are very complex. It is difficult to know (...) the intended effect. Typically (...) measures work together to trigger an effect. (Administrative leader D)*

Hence, the verdict is still out as to how successful the scheme will finally become, reflected also by the fact that it has been in operation only 4 years.

### 4.3 | Interactive governance enhances collaboration and self-governance

#### 4.3.1 | Enhancing collaboration and self-governance in the private sector

Despite the limitations of the climate budget as a governing tool, the related design and implementation processes have triggered the adoption of a set of innovative governing instruments and policies, as well as new interactive governance approaches. Revealing the large CO<sub>2</sub> emissions arising from own construction sites, which the Climate Agency discovered through the technical design of the climate budget process, the city government moved to mobilize own authority as large purchaser of services and goods to change the *municipal procurement rules* in own tenders. These new procurement rules included stronger climate criteria and were developed with substantive involvement of private-sector networks. The new rules are considered by both public and private actors as a key step to align internal and external actors for shared promotion of policies for zero-emission buildings, electric machinery, and clean construction sites (City of Oslo, 2019a, 2019b, 2019e). Innovations in both technology, practice and governance are emerging with implications for national and city-level policies and regulations. The transformative potentials of reformed procurement rules, in combination with the networking of public staff with key market actors, are illustrated by the following two quotes.

*When you (...) also get business players to push the same market, you get the opportunity to really create change and I think that is exciting. (Administrative advisor B)*

*You do not get a company with a healthy economy to respond to uncertain procurement or market signals. We need to know the direction. (...) The supplier industry in general can fix anything, provided we get some lead-time and know that we compete among ourselves on similar terms. Buyers and procurers need to be aware that the environment and sustainability counts in the assessment of tenders; this provides a super important signal. (Private consultant)*

Overall, regarding the role of the private sector in Oslo in climate action and trans-local networks, our interviews suggest that the business sector holds considerable promise as collaborative partner and for performing climate change self-governance. This is in line with what other authors find in other global cities (Lister, 2018), even if there are also limits to their potentials. The business rationale of private firms across the city of Oslo, many among which are part of the trans-local Business for Climate Network (BCN; 150 firms) and Green Building Alliance (200 firms) and other networks and arenas, underpin shared climate mitigation schemes. It has become commonplace to integrate sustainability visions and references to SDGs, and the Paris Agreement in contemporary business models, both among private firms and many non-profit civil society think tanks and foundations. Recently, key Oslo-based firms within the building- and construction sector have even in public newspaper articles requested stronger climate requirements by the city government in response to climate concerns.<sup>2</sup> All the private company representatives we interviewed (eight interviews), suggested to this end, that there had been a recent ‘paradigm’ shift among key private business actors reflecting broad ideas circulating in town (and globally); revealed not least during 2019 when Oslo celebrated the European Green Capital Award. As suggested by the director of one of the largest transport companies:

*We are working with trucks and transport of goods. Hello...? How exciting is that? We want to do something bigger (...) this (sustainability) is a goal for both the heart and the brain, it's about our conscience, it's about the future, about working with something which is really meaningful. (Transport company A)*

As such, Oslo's climate goals and visions seem to add an enabling layer on top of an engagement that is already to a large degree present among entrepreneurs and developers in the private sector. To this end, private firms and related networks play a driving role within what may be deemed as Oslo's dynamic ‘governance ecosystem’ in the climate arena (cf. Held & Roger, 2018). However, there are also limitations to their approaches, private businesses and developers also pursue own interests that may be at odds with broader environmental or societal goals, for example in compact city development regarding

the need to protect green areas or public spaces or protests over restrictions on fossil-fuelled vehicles. Moreover, our interviews suggest that the interpretation of the new procurement rules linked to, for example, the more precise definition of 'fossil-free' construction keep varying from one municipal agency and sector to another, reflecting diverse interpretations among both public entities and private entrepreneurs of what constitutes 'fossil-free' constructions (Multiconsult, 2018). Hence, knowledge sharing, as well as direct and indirect incentives, motivations and regulations by public actors are likely to be essential for increasing local businesses' climate ambitions and contributions and taking climate actions to scale (cf. Lister, 2018).

### 4.3.2 | Business for climate network as an interactive platform and arena

Reflecting the need for an external collaborative arena between the public and private sectors, our respondents highlighted the growing importance of the city government-created 'Business for Climate Network', which is designed as a collaborative platform (Ansell & Gash, 2018). The Network is managed by the Climate Agency (secretariat function) and serves as a reinvigorated interactional arena for collaboration between climate-progressive members of the business community, citizens and NGOs and municipal staff/politicians and agencies towards achieving Oslo's climate goals.<sup>3</sup> The rationale for the Network is illustrated by the following quote from a senior administrative staff manager of the network:

*If we are to achieve the (climate) goals, we must continuously demand more from the companies in Oslo.*  
(Administrative advisor C)

Close to 150 businesses and institutional actors in the Oslo-region are now members (initiated as Oslo's Climate Compact in 2010). In order to ensure genuine commitment to the collaborative processes, the CEO must solemnly sign a compact and express willingness to contribute to attain Oslo's climate goals and ensure anchorage of the climate agenda in the core business models. Interviewees from the private sector partakers, both among the businesses and environmental foundations, suggest that their main motivation for participating is to be able to interact with political and administrative representatives of the city government on key policy issues and acquire information about new municipal initiatives. Nevertheless, they also stress benefits such as to meet like-minded professionals, and to get inspiration and energy and acknowledgement from fellow business actors. The network leadership organizes a variety of co-created arenas related to specific topics, spanning from top management meetings, ordinary network meetings and thematic meetings to discuss policies and instruments, such as the climate budget, procurement, planning, and funding. Newsletters, web page and minutes of meetings ensure that input from participants contribute to policy changes and the transparency of the network. Hence, the co-creation processes within the network contribute in important ways to shared learning, new ideas, openness and accountability regarding new policies

or instruments, and opportunities for more innovative, sustainable self-governing. The compact and operating routines of the network serve as 'clear ground rules' for the co-creation processes (cf. Ansell & Gash, 2007, 2018), which, in turn, feed lessons into self-governance.

### 4.4 | Combining integrative and interactive governance in experimentations

Beyond the government-initiated BCN, a variety of networks between public and private actors are emerging across Oslo, which are central to the shaping of urban climate policies and governance and socio-technical experimentations (as observed by Smeds and Acuto, 2018 and Bulkeley et al., 2015 for other global cities). Such experimentations are observed across many global cities. A pitfall of networked urban experimentation in its current form has been on whether and how such experimentations are scaling, that is, 'scaling out' to change city networks and markets and 'scaling up' to change policies (Smeds and Acuto, 2018).

The adoption of fossil-free construction site policies in Oslo is in this regard an interesting and illustrative example of the networked nature of experimentations. The long-term aim of the city is to achieve zero emission from all construction sites by 2025. The first 'fossil-free' building site in Oslo was, however, conceived and developed relatively spontaneously between one dedicated environmental foundation and a public building agency which both wanted to pilot the approach in building of a welfare institution prior to 'clean construction' being adopted as city policy (in 2015). The experimentation featured construction processes and the use of transport technologies that was radically novel at the time, for example, low-carbon building processes and attempt to use electric machinery and vehicles that was either not directly available or needed to be produced through remaking of diesel driven machinery. The technological approach was in part co-developed with the collaboration of other key public-private networks. Clean construction further 'scaled out' to two other pilot-initiatives where public building agencies partnered with other civic and private organizations. Subsequently several other private building- and construction firms have adopted the clean construction-approach as they place tenders with the municipality. In 2018, the approach became city policy indicating how the experimentation was 'scaling up'. The policy became manifest in the city's introduction of new climate criteria in reformulated procurement rules and in new planning and building guidelines with specific climate criteria. Oslo at present demands fossil-free/emission-free sites across all own construction sites. However, the city government also works to make such requirements standard in all new constructions within the city.<sup>4</sup> The policy approach has furthermore been taken up in the policies of neighbouring municipalities and by other major Norwegian cities (further 'scaling out'). As of late, several relevant and concerned national entities in Norway has also adopted or accepted the policy of fossil-free construction sites, suggesting that the experimentation is also 'scaling up'. The policy has been adopted by the national energy efficiency fund, which provides ample support for such experimenting, as



well as by the body in charge of national procurement policies (the national directorate for procurement). The policy of fossil-free construction is also internalized in the BREEAM-NOR standards, which are the most utilized Norwegian environmental certification for all types of buildings. Moreover, recently, the national Minister for Climate and the Environment declared that all construction sites by the Norwegian government should be fossil-free by 2025.

Transnational networks play an important role in this 'scaling' of fossil-free construction policies (Bulkeley & Castán Broto, 2013; Pierre, 2019). Oslo recently joined the cities of Copenhagen, Stockholm and Helsinki to promote a 'clean construction' policy declaration to be adopted by the C40 cities at the 2019 annual conference. Clean construction is at present the recognized policy within C40 and among many of the member cities. Moreover, C40 in 2020 decided to establish an Oslo C40 office for clean construction and governance experimentation, the office being housed within the Climate Agency.

Oslo's strategic work with other large cities and city-networks has diverse rationales, including learning and influencing global policies and markets, as underscored by a central administrative advisor:

*The city of Oslo involves 700,000 people, and has little influence on the global market situation, but if we can connect to San Francisco, Los Angeles, New York, Vancouver, Sydney, London, Paris ... Then the market knows that to build in London, Paris and Oslo and all places we must have zero-emission solutions. (Administrative advisor D)*

Our interviews with senior officials in the Climate Agency further confirmed the importance of networks, and how the 'scaling out' also has implications for European policy network initiatives, such as EUROCIITIES and ICLEI. For example, city officials recently engaged with the EU Commission's Big Buyers Initiative (BBI), an initiative linked to EUROCIITIES. Oslo now heads a working group of BBI on clean construction sites. BBI is the EC initiative for promoting collaboration between big public buyers in implementing strategic public procurement and provides Oslo with an opportunity to engage with other public authorities in cities across Europe and shape new innovative solutions to procurement and zero-emission construction. To this end, engagements by city officials in these European networks 'bypass' the policies of the nation state. Impacts on EU policies, in turn, have feedback effects on national-level policies.

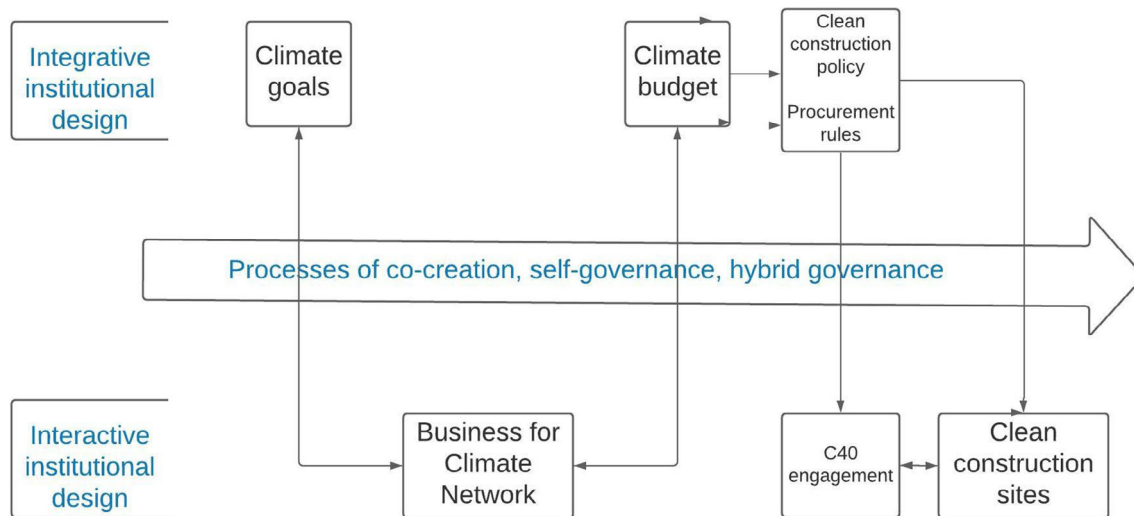
## 5 | HYBRID AND POLYCENTRIC URBAN CLIMATE GOVERNANCE

In sum, the empirical findings from the study of Oslo bring out a city climate governance approach drawing upon a dynamic mix of integrative and interactive instruments. The approach shows high complexity in terms of the types of instruments designed and employed, and the number of actors, networks and scales involved. The city leadership within and outside the Climate Agency seems to carefully design and piece together instruments by combining

overall municipal planning and climate policies with an array of co-created experimentations aimed to pursue the climate agenda as a collective and collaborative endeavour. They push for the design and testing of new innovative instruments, as well as engagement with actors in formal and informal networks to stimulate experimentation and learning. With limited direction from the national level, city leadership and managers took bold initiatives to further dynamic climate governance across sectors, actors and scales beyond what would be expected of them within a conventional bureaucracy with command-and-control systems.

Figure 2 illustrates the interactional processes involved and how the adoption of bold *climate goals*, which were negotiated within the BCN and in various citizen arenas, laid the premises for developing the *climate budget* as a main climate steering instrument to pursue goals and ensure internal alignments (manifest in the financial budget). The climate budget process subsequently triggered actions across sector agencies and actors – and spurred innovation of both integrative and interactive instruments such as *new procurement rules* and several co-created experimentations with *clean construction sites*. The climate budget also motivated new planning criteria and underpinned the city's elaborate mobility strategy and public transport system approach. Hence, the public leadership's employment of integrative and regulative, bureaucratic instruments, some of which appeared in new suits, laid premises for co-creation and networked experimentation in governance and socio-technical interventions, exemplified by clean construction site policies to promote compact, healthy and liveable city development. These city climate policies as they relate to, for example, procurement and clean construction sites were pursued through trans-local and transnational networks (e.g., C40, EUROCIITIES) to change both global and European policies and international market actors (producers of electric machinery and vehicles). We observed limited resistance to act on the climate goals among public officials, albeit some knowledge constraints. Rather several agencies pursued self-governance strategies taking initiatives on their own that occasionally went further than what was expected by the city government.

Our findings indicate that collaboration and co-creation processes within urban governance are initiated on a needs-basis, in instrumental ways, linked to the developing of new strategies, instruments and/or technologies and when operating in unploughed field. This is when new ideas, knowledge and experimentations are required, and new governing instruments need to be anchored. For example, the Climate Agency used the BCN actively to develop, test and get response on new climate policies and instruments (e.g., climate strategy, procurement rules, climate funding), and to enhance collaboration and buy-in to the policies. Beyond the overall meta-governing inherent in the conventional, bureaucratic city planning processes, collaboration in experimentation emerged through iterative or virtuous cycles of formal and informal dialogues in a variety of meetings and trans-local collaborative arenas, including in well-known forums such as the BCN. These arenas contributed to the building of relationships, confidence, and trust, which transformed into joint commitment to goals and shared understanding of key relevant topics. In turn, this led



**FIGURE 2** The Oslo model of climate governance – complex, hybrid, dynamic, polycentric [Color figure can be viewed at [wileyonlinelibrary.com](http://wileyonlinelibrary.com)]

to collective agreements on division of roles and responsibilities and agreed actions to be taken back into the self-governing ‘units’ (cf. Ansell & Gash, 2007).

The BCN had clear ground rules (defined in a compact agreement), relatively open boundaries for membership, yet a sense of exclusiveness was added to the membership in terms of ensuring CEO buy-in and request for outright commitment in self-governing and business models. Overall, this network platform reflects strong design principles of a well-functioning collective with clearly defined boundaries and operational rules (as suggested by Ostrom, 2010 to be essential). The city climate governing approach appears dynamic, hybrid, and, at least at times, synergistic, promoting linkages between actors, networks and scales within the framework of a polycentric regime (or governance ecosystem). Interactions were not linear or developing in stages from goals to plan to implementation but were iterative with feed-back/feed-forward processes involved (as observed by Bulkeley, 2013, 2015).

## 6 | IMPLICATIONS OF EMPIRICAL FINDINGS FOR THEORY AND POLICY

Our findings from the analysis of the Oslo approach provide reasons to nuance theories of urban climate governance, as well as theories of co-creation and perspectives on the ‘scaling’ of experimentations. Our observations also point to certain future challenges to urban climate governance and the role that city governments can play.

### 6.1 | Theoretical implications

First, in line with recent research, we suggest that *climate goal-setting* deserves greater attention in urban climate governance research

(Hofstad et al., 2021; van der Heijden, 2018). The goal-setting and the operationalization and integration of clear, yet narrow CO<sub>2</sub> reduction goals into a coherent policy framework by the municipal leadership proved to be an essential instrument for motivating and triggering innovation in institutions, instruments and socio-technical experimentations within as well as outside the municipal sphere of authority. This goal-clarity motivated actions and interactions both among internal and external actors. The goal and climate budget process combined to promote strict internal indicator-based monitoring and reporting on progress, internal alignment and learning; monitoring representing a strong governing tool for enhancing collective actions (cf. Ostrom, 2010). Establishing a sense of urgency as in the accelerated agenda of the Climate 2030 goals worked to further drive different actors to search for new opportunities and risk to pursue experimentation (cf. Smeds and Acuto, 2018).

Second, the findings reveal how Oslo's climate governance *gradually strengthens the combined use of both integrative and interactive/co-governance* instruments, backed by strong political leadership, internal capabilities and an evolving agenda. The initial approach represented mainly a combination of integrative and regulative enforcement, spurred by the climate budgeting process, while the focus on co-governance and networked experimentation and participation was gradually strengthened as the strategy was broadened and widened to include a greater number of interventions and relevant and concerned actors. This is in support of collaborative governance theory related to the need for co-creation to tackle unruly, collective problems (Torfing et al., 2016; Sørensen & Torfing, 2019; Ansell & Gash, 2018; Torfing & Triantafyllou, 2016, p. 288; van der Heijden, 2019). The various arenas and interactional processes levered in additional resources and facilitated capacity building and ‘scaling out’ processes, as well as ‘scaling up’ to change the city and national policies.

Third, the findings indicate that collaborative governance and more specifically *co-creation* is utilized to assemble and align entities

both *within* the municipal organization, *as well as between* public and private units. Hence, the definition of co-creation, which until recently has been focused on types of collaboration only *between* public and private actors (cf. Torfing et al., 2016), should be considered expanded and changed to involve also collaboration among public entities within the local government as well as among private actors beyond the influence of the city government. This suggested change in definition has been observed also by other scholars in the latest contributions to co-creation scholarship (Sørensen & Torfing, 2020). Moreover, the traditional strong focus on citizen involvement in public-initiated co-creation should be expanded to include a focus on the collaboration among all sorts of relevant actors; private business actors, organized civil society *and* citizens and other public actors. Each type of actors brings different resources to the table and should be involved for different kinds of reasons. The organized private sector represents both relevant, concerned, legitimate and necessary actors for pursuing effective, efficient and fair climate governance – in co-creation with other actors as well as in their pursuit of self-governance.

Fourth, *the choice of a synergetic mix between traditional and innovative integrative, regulative and collaborative instruments of governing and experimenting, backed by political support*, is the main success factor for operationalizing urban climate governance in Oslo. The benefits of such *hybrid* governing in terms of fostering of co-governance are observed by other scholars for other cities (van der Heijden, 2018, 2019; Hoelschera et al., 2019; Díaz-Pont, 2020; Smeds and Acuto, 2018). However, our findings provide nuances to the arguments found in the co-creation literature that traditional, bureaucratic (local) government administration often or even mostly hinders collaboration and co-creation between actors (Torfing et al., 2016, p. 18). The argument is that public administration, with command and control systems and compartmentalized sectors, leads to prioritization of stability over dynamic development and limitation of knowledge sharing and resource exchange between actors. Traditional bureaucracies conserve institutional lock-in and hamper collaboration (Torfing & Triantafillou, 2016, p. 287). Consequently, a key argument of co-creation theory is that the public sector *needs to transform* from a previous authority/regulative mode to a collaborative mode (Ansell & Torfing, 2016; Torfing et al., 2016). The Oslo case suggests that this perspective represents a portrayed picture of how public administration actually operates in practice. Our data reveal that climate responses benefit from a multifaceted governance approach employing a combination of integrative and interactive instruments. Good integrative governance seems to condition good interactive governance and vice-versa. Hence, our empirical observations suggest that we should avoid portraying contrasting images of two strictly divergent forms of governance and related governing instruments, one form vested in traditional bureaucratic governing and another in new forms of collaborative or co-creational governance. Rather, we should study in what contexts and how diverse governing instruments and modes can operate in mixed forms, and often in concert to produce linkages and synergies within a polycentric approach. This echoes findings from recent co-governance and climate and sustainability research (Visseren-Hamakers, 2018; Bulkeley, 2015; Sørensen &

Torfing, 2019; van der Heijden et al., 2018; Jordan et al., 2018). As stressed, this does not mean that contradictions, dilemmas and conflicts in mobilizing internal as well as external constituents are not also present and need to be coped with by urban leadership (Pestoff, 2018).

Finally, we found evidence that *networked experimentations, when initiated within a relatively well-integrated polycentric regime, reveal potentials for scaling to influence policy integration as well as strengthen linkages across internal and external actors and units within the polycentric governance regime*. What started as one local experimentation in fossil-free construction by one civic foundation and one public building agency in Oslo in 2015 has subsequently been ‘scaling out’ as well as ‘scaling up’ to change national and international networks and policies and build capacity in the city. This is at odds with what Smeds and Acuto (2018) and Bulkeley and Castán Broto (2013) find through their reviews of cities’ networked experimentations. They suggest that ‘scaling up’ processes rarely happen. Van der Heijden (2018) similarly suggests that evidence about the successful outcomes of scaling remains an open question, referring also to situations when climate experimentations are utilized to justify ‘neo-liberal’ development with limited attention to sustainability. The Oslo case rather illustrates that when diverse actors operate within a highly motivated political environment, directed by clarity in goals and predictable approaches, ‘scaling’ in the form co-created problem solving and diffusion of bold ideas and experimentations may follow.

## 6.2 | Implications for policy and urban climate governance

It is too early to say what the climate responses and experimentations in Oslo will amount to on the ground in terms of reduced emissions, resilience and sustainable transformation. On the one hand, the adoption of climate change as a core strategic urban policy both directly and indirectly shape contemporary policy directions and governing decisions that guide compact city development, green and public mobility, climate-friendly planning principles and new policies of fossil-free construction. There are clear signs of accelerated reduction in CO<sub>2</sub> emissions in many areas, and emergence of many new pilot projects and experimentations across key climate-relevant sectors. However, progress is uneven and several governance challenges remain.

First, *the climate budget process*, which is critical for both integrative and interactive processes, faces challenges related to firm internal anchorage and capabilities to design and develop the tool. The quality of the tool also relates to the city’s dependence on timely knowledge input from national statistical agencies. The latter issue has pushed the city to acquire emission/climate data also from other public agencies.

Second, *the reorientation of professional staff and leaders across internal entities* needs further reinforcement (horizontally and vertically). This requires continuous strengthening of the collaborative mentalities and processes between city officials, private actors,



citizens and state agencies to keep enhancing shared views on goals, knowledge and how best to arrive at optimal, synergistic governance regimes. It presupposes common understanding of what mind-sets experimental and co-creational leadership entail as collaborative capacity builders (Weber & Khademan, 2008). For example, we have observed that the ‘scaling’ of new procurement rules and policies of clean construction, presupposes greater agreements among public entities and firms about what exactly ‘fossil-free construction’ entails and what the boundaries are and how experimental leadership should be exercised. Moreover, there are also *technical and infrastructural issues* as well as *knowledge constraints* on how to go about ‘fossil-free’ construction and transforming the wider urban economy towards circular economy principles. This underscores that institutional transitions require time and efforts to evolve (cf. Bulkeley et al., 2015).

Third, as suggested above, a polycentric perspective on urban climate governance needs to fully acknowledge *the crucial importance of private business, civil society and networks* as components of a dynamic governance ecosystem in the climate arena (Held & Roger, 2018). The importance of such actors is manifest in a lot of spontaneous and distinctive institutional innovations and project experiments from the bottom-up. Such processes reflect local circumstances, self-governance rationale and local initiatives. The varieties of interventions and networks that keep emerging produce a diverse, dispersed, yet also largely connected, multilevel pattern of governing across actors, authority spheres and scales in line with a polycentric system (cf. Bulkeley et al., 2015). Some private business actors even request stronger climate demands from the government, in contrast to how business rationales are often portrayed as narrowly profit-maximizing (van der Heijden, 2018). Urban polycentric governance thus needs to accept such ‘bottom-up’ initiatives and place-based solutions to decarbonization. Broad popular support for contextual climate actions among a variety of community, civic and private actors is required to succeed with urban climate transformation.

Fourth, despite the national climate policies being generally supportive, we have shown that the city government frequently engages with *national state actors and policies* to address perceived local barriers and to defend own policies in specific domains, such as within mobility/transport and infrastructure policies, city planning regulations, and climate and energy investment funding (Hanssen & Hofstad, 2020; Hofstad et al., 2020). City authorities and administrative staff have also utilized interactions with the transnational network to break out of traditional top-down or vertical national-regional-city hierarchies, such as in the engagement on procurement and clean construction policies with EURO-CITIES and C40. The aim has been to create synergistic linkages between national and international partakers within the broader polycentric regime, and, in this vein, also to change national policies.

Finally, reflecting recent climate protests in the city and potential set-backs to former agreements over climate policies, for example, from anti-toll ring protesters to youth school strikes, city politicians and leadership need to tackle *emerging contestations and political opposition* to climate policies (both pro- and con-movements). To this end, collaborative governance approaches

need to confront also broader conflicts and issues of equity, trust and the need for broad-based citizen participation (Bulkeley, 2015; Pestoff, 2018).

## 7 | CONCLUDING REMARKS

The Oslo case provides for cautious optimism regarding the operationalization of a polycentric urban climate governance approach. Oslo's approach reveals evidence of how a city administrative leadership, with continuous cross-party political backing, is capable of pursuing bold and clear climate goals, establish a well-capacitated climate agency, and design an effective hybrid mix of integrative and interactive governing instruments that fosters synergies, linkages and innovative outcomes in terms of co-creation and self-governance. The adoption of a regulatory climate budget process (with strict internal monitoring and reporting) worked to enhance internal collaboration and alignment across sector entities. In turn, this triggered collaboration in networks and co-created experimentation, a scaling of the experiments, and improved, voluntary forms of self-governance among a variety of both public and private actors and their organizations. The findings underscore the importance of strong political backing and the choice of a good mix of integrative and interactive instruments through experimental leadership. Oslo thus has started an interesting pathway towards climate transformation embedded in a dynamic governance ecosystem.

However, governance challenges remain. The city leadership recognizes that it needs to keep accelerating cuts in CO<sub>2</sub> emissions and deepening and widening the scope of the approach. This involves more fully embracing the broader sustainability agenda and moving beyond the present ‘CO<sub>2</sub> fixation’ towards addressing, for example, critical consumption and circular economy issues. In this regard, the climate governance agenda will continue to challenge deep values and ingrained behaviours among both citizens and private businesses. Hence, climate governance, being inherently a political endeavour, will keep relying on a stable, yet bold political leadership. Leadership needs to develop a stringent and predictable governance system with sufficient flexibility to enable adjustments and corrections when confronted with new demands and challenges. In this regard, inclusive strategies that enhance broad stakeholder involvement and just transitions are significant traits of an integrative and co-created climate governance approach.

Reflecting these empirical observations, we have suggested nuances to theories of polycentric urban climate governance and the role of co-creation and networks in tackling a changing climate. We also propose that future research would gain from a stronger focus on how and why hybrid forms of governance are required to bring a diversity of public and private actors and networks together in synergistic and dynamic fashions for just and sustainable climate futures. This may fruitfully be done within a polycentric perspective that perceives city actors and organizations as nested and linked ‘units’ within the dynamic governance ecosystem of the climate arena.

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## ENDNOTES

- <sup>1</sup> C40 is a network of the world's megacities committed to addressing climate change. CNCA is the Carbon Neutral Cities Alliance which is a collaboration of leading global cities aiming for carbon neutrality before 2050. EUROCITIES is a network of 190 cities in 39 European countries coordinating knowledge-sharing and joint work across Europe.
- <sup>2</sup> <https://www.aftenposten.no/meninger/debatt/i/rAOaza/still-strengere-klimakrav-til-oss-i-bygg-og-anleggsbransjen-monica-m>
- <sup>3</sup> <https://www.oslo.kommune.no/prosjekter/naring-for-klima/#gref>
- <sup>4</sup> <https://www.klimaoslo.no/wp-content/uploads/sites/88/2020/09/Klimabudsjett-2021.pdf>

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