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Expanding scope: the role of legitimacy and legitimation in the adoption of consumption-based carbon accounting in European cities

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Introduction: In the pursuit of carbon neutrality, cities are increasingly measuring their greenhouse gas emissions. Most cities focus on territorial emissions tied to production, excluding consumption-driven emissions outside city boundaries. This gap is critical, as Scope 3 emissions can represent as much as 80% of cities' carbon footprint. Addressing this limitation calls for urban consumption-based carbon accounting (CBCA). Yet, despite CBCA's relevance for climate action, it has struggled to gain political legitimacy within European cities. This raises the question: How can urban CBCA achieve political legitimacy?

Methods: Based on semi-structured expert interviews with municipal practitioners in 17 European cities, we explore the barriers, enablers, and strategies used to enhance CBCA legitimacy. We develop a framework that describes the process of CBCA legitimation from exploration to political legitimacy.

Results: Results show that urban CBCA's legitimacy rests primarily on cognitive legitimacy. Throughout the legitimation process, data plays a crucial role. Initially, access to data and clear calculation methodologies contributes to comprehensibility by making urban CBCA seem plausible and predictable. However, once CBCA comprehensibility is achieved metrics become less important than acting in ways that align with the broader understanding of consumption-based emissions. Finally, as CBCA measures affect citizens more directly, metrics resurface as means to validate impacts of past policy decisions and thus reinforce CBCA's legitimacy.

Discussion: We discuss the various pitfalls and promising strategies to build political legitimacy for urban CBCA. This research contributes to the understanding of how urban CBCA legitimacy evolves over time. The legitimation framework developed can help inform policymakers in their endeavors to advance CBCA legitimation and institutionalization.

KEYWORDS

urban carbon accounting, consumption-based emissions, urban climate governance, political legitimacy, climate change mitigation

1 Introduction

Across the globe cities are working to reduce their carbon emissions. Urban efforts are important for climate mitigation given cities' responsibility for 70% of the world's emissions [Intergovernmental Panel on Climate Change (IPCC), 2023] while being home to 58% of the world's population (World Bank, 2025). Despite the large urban impact on global greenhouse gas emissions, cities are well placed to reduce them. Urban density and infrastructures can help reduce emissions from production (Timmons et al., 2016, p145), while municipal governments tend to enact more progressive climate mitigation policies (Lo, 2014, p274), often due to their unique influence over local planning decisions, building stocks, transport networks and other infrastructure, coupled with close connections with local civic groups, businesses, and regional governments (Sudmant et al., 2018, p655).

Historically, within the European context, cities were developed off the back of industry (Lever, 1991), a process exemplified during the rapid industrialization and urbanization of the enlightenment period, a phenomenon supported by fossil fuels (Smil, 2017, p352). From a carbon emissions perspective, these industrialized cities would be a net-source of carbon, with the burning of coal in particular fueling the development and growth of these cities. However, in the aftermath of World War II, European cities underwent a transition. They pivoted from being sites of industrial production to homes of service industries (Clark, 2016, p73). While some cities, such as Luxembourg City (Thomas et al., 2019) and London (Lever, 1991) adapted successfully, some cities did not (see Murray, 2022). Deindustrialisation saw many legacy industries 'offshored' to emerging economies across the world (Peck, 2017, p22). Along with them went the carbon emissions associated with production and transportation of goods consumed in European cities. This reality is reflected in production-based carbon accounting rules that hold producing nations responsible for emissions driven by the consumption of European citizens.

This situation is reproduced by key institutions such as the Global Covenant of Mayors for Climate and Energy, the largest global alliance for city climate leadership which boasts over 13,000 city members (Global Covenant of Mayors, 2024). To become a member, cities must produce a 'basic' emissions inventory, according to the GHG Protocol for Cities (GPC)—an urban carbon accounting standard developed by the World Resources Institute (GPC, 2021). The emissions inventory "covers emission sources that occur in almost all cities (Stationary Energy, in-boundary transportation, and in-boundary generated waste)" (ibid). This limits emissions accounting to emissions produced within the territorial boundary of the city.

According to Lombardi et al. (2017, p44), when measuring and monitoring urban impacts on global emissions, scope is crucial. The GPC outlines three scopes for urban carbon accounting. Scope 1 covers emissions from sources located within the city boundary. Scope 2 considers emissions due to the use of grid-supplied electricity, heat, steam and/or cooling within the city boundary. Scope 3 encompasses emissions that occur outside the city boundary as a result of activities taking place within the city boundary (GPC, 2021). Scope 3 emissions are rooted in the consumption of goods and services by city residents and organizations but are not taken into account when conducting 'basic' accounting. Accordingly, cities across Europe have focused on reducing their production emissions. According to Harris et al. (2020,

p10), production emissions in European cities are on course to fall by 31%, while consumption emissions are expected to rise by 33%. For service economy cities—as opposed to cities engaging in industrial activities—consumption emissions can represent up to 83% of the total urban carbon footprint (Goodwin et al., 2023, p146). These figures highlight the importance of accounting for and reducing consumption-based emissions.

While Scope 1 and 2 emissions are relatively simple to account for, Scope 3 emissions present a far greater challenge. Scope 3 emissions are tied to the everyday practices of residents, and accounting for them requires more complex data collection and calculation procedures (ibid.). Hence, expanding urban carbon accounting practices to include consumption emissions is beset by a host of challenges and complications—ranging from the acquisition and production of suitable datasets (Ramaswami et al., 2008, p6456), through to the ethical ramifications of quantifying lifestyles and determining emission responsibility (Fuller, 2017, p521). However, in the words of Wiedmann et al. (2021), if cities do not explicitly take consumption emissions into consideration, "they miss a large part of what is needed in terms of climate action" (p745).

Studies on the legitimacy of CBCA have focused mainly on normative legitimacy. CBCA is generally considered to be more effective in reducing emissions (Peters and Hertwich 2008; Steininger et al., 2014; Liu, 2014), fairer (Duus-Otterström and Hjorthen, 2018; Peters and Hertwich, 2008; Steininger et al., 2014) and more democratic (Grasso and Roberts, 2014) than production-based carbon accounting. Yet, despite its strong normative legitimacy, CBCA's adoption has proven difficult due to production-based accounting's embeddedness in socioeconomic practices (Peters, 2008). Hence, to shift from production- to consumption-based carbon accounting, CBCA must be both normatively justified and politically legitimate. While some studies have explored the political feasibility of CBCA at national and international scales (Grasso, 2015), few have investigated CBCA's political legitimacy at the urban scale.

This paper is built out from a broader investigation into the governance barriers preventing the adoption and development of urban consumption-based carbon accounting (CBCA) in European cities. Throughout the research process, it became clear that legitimacy poses a particularly acute challenge to CBCA adoption and implementation. Actors are struggling to simultaneously expand carbon accounting practice, while justifying their efforts within the political arena. Attaining political support to devote time and resources to a form of carbon accounting which will almost certainly result in an increase in reported emissions is challenging. This begs the question: How can urban CBCA become legitimate?

To investigate how legitimacy is constructed within the structures and practices of urban governance, calls for a sociological approach to legitimacy. Suchman (1995) defines organizational legitimacy as "a generalized perception or assumption that the actions of an entity are desirable, proper, or appropriate within some socially constructed system of norms, values, beliefs, and definitions" (Suchman, 1995, p577). In the context of environmental governance, Bernstein (2005) defines political legitimacy as the acceptance of shared rule by a community as appropriate and justified. As opposed to normative approaches to legitimacy, sociological approaches imply that legitimacy is not fixed. Rather, legitimacy is a condition within a broader process of legitimation that evolves over time.

Building on these understandings, this paper asks the following questions:

- 1 How can urban CBCA achieve political legitimacy?
- 2 What types of legitimacy for urban CBCA are achieved?
- 3 What are the barriers, enablers, and strategies to gain greater urban CBCA legitimacy?
- 4 What is the legitimization process for urban CBCA?

To answer these questions, the paper is structured as follows. To begin, the analytical framework of this research is presented, followed by an overview of the materials and methods used. Next, the results are presented, encompassing insights gleaned from the coding process. Based on these results, phases of political legitimization are described, potential pitfalls are situated, and promising strategies are identified to enhance urban CBCA's progress towards political legitimacy. This feeds into a discussion on the various roles of metrics in urban CBCA legitimization.

2 Analytical framework: legitimacy and legitimization

We adopt a sociological understanding of political legitimacy. From this perspective, political legitimacy is based on the beliefs and perceptions of relevant audiences that a political institution is appropriate (Tallberg and Zürn, 2019). These beliefs and perceptions are forged in relation to social norms about the appropriate exercise of authority (Suchman, 1995).

As a relational concept, political legitimacy is constructed through the process of legitimization, whereby legitimating agents influence audience beliefs about political institutions through legitimization discourses. Legitimizing agents position themselves by assigning characteristics to themselves or others. Legitimizing audiences may be categorized as constituencies or observers; targeted or self-appointed (Bexell and Jönsson, 2018). Constituencies have formal ties to the legitimating agents that observers do not. Targeted audiences are positioned with respect to key issues by legitimating agents, while self-appointed audiences position themselves. Audiences may be internal participants, or external observers, of a legitimacy seeking institution (Biermann and Gupta, 2011). While analytically useful, these categories often overlap. In this study, we focus on how municipal practitioners perceive the CBCA's legitimacy. In this context, municipal practitioners are legitimating agents and targeted/self-appointed constituencies.

Legitimation discourses call upon legitimacy sources to respond to different audience expectations. Legitimacy sources can be classified in several ways. Suchman (1995) proposes that legitimacy is based on pragmatic, moral or cognitive reasoning. Pragmatic legitimacy is based on active, self-interested calculations made by audiences interacting directly with legitimating agents. Moral legitimacy is based on normative judgments that an institution or its actions are right or in the interest of the common good. Cognitive legitimacy is based on the passive acceptance of institutions that make sense or seem inevitable in a given context. Suchman (1995) also distinguishes between legitimacy tied to actions and legitimacy associated with attributes. Adapting Suchman's typology to urban CBCA legitimacy resulted in the framework described in Table 1 used to guide our analysis.

But how is legitimacy gained, maintained, and repaired? Suchman (1995) proposes the legitimacy may be gained by conforming, selecting, or manipulating environments. CBCA may gain legitimacy by conforming to existing standards or aligning with shared ideals (e.g., sustainable development or climate justice principles). When conforming to the existing environment requires too many compromises, it may be more appropriate to select environments that may be more receptive. In the context of urban CBCA this may mean gaining early support from sectors that will not be significantly affected by the change in accounting practices. Organizations having strong transactional or cooperative relationships with municipal government or industry actors that are already conforming to more stringent standards may help build supportive coalitions for CBCA. Finally, proactive urban policymakers may manipulate environments by creating new visions, expectations, and beliefs surrounding emissions accounting. Environmental manipulation may involve advocacy for consumption-based metrics, communication campaigns emphasizing consumer responsibility for emissions, the creation of working groups to advance CBCA methodologies, and delegitimation through demonstrations of the inadequacy of production-based methods. Maintaining legitimization requires that stakeholder expectations be monitored and successful experiments be scaled up. Specific tactics include monitoring methodological improvements, incorporating multiple stakeholder perspectives, mainstreaming CBCA across urban departments, and institutionalizing CBCA through policies and programs.

Urban legitimization environments, however, are complex. As involvement of legitimating audiences with different interests, values, and rational patterns increases, so does the likelihood of conflicts. Meyer and Rowan (1977) propose that conflicts may be managed by segregating or integrating environments. However, applying CBCA to segregated environments, to maintain legitimization consistency, could be perceived as unjustly distributing the costs of conforming to CBCA regulations. Moreover, if segregation follows environment selection, it seems likely that those that are most amenable to CBCA will shoulder the greatest burden. Integrating environments raises the bar in terms of legitimization because it requires that CBCA be legitimated in such a way that it becomes acceptable from all perspectives. While the diversity of perspectives is challenging it is also necessary. As highlighted by Bitektine and Haack (2015), under conditions of institutional change like the shift from production- to consumption-based accounting, legitimacy is not determined by judgment validating institutions but rather driven by divergent perceptions, judgments and actions.

Once legitimacy has been gained it must be maintained. Suchman (1995) suggests that legitimacy can be maintained by anticipating changes or emphasizing past successes. Changes in legitimating audience values, beliefs, and expectations can be monitored closely by integrating representatives with different perspectives in the CBCA development process. Hard gained legitimacy can also be maintained by shifting from a reliance on short-term legitimacy to long-term legitimacy sources. In the context of urban CBCA, demonstrating the impacts of past CBCA efforts, making data and methodologies publicly available, imposing ever more stringent calculation criteria on municipal activities can help protect CBCA from legitimacy challenges. Finally, municipal governments can accumulate dispositional legitimacy by fostering a trusting relationship with citizens. But which strategies are mobilized when in the process of CBCA legitimacy?

TABLE 1 Typology of urban consumption-based carbon accounting (CBCA) legitimacy sources.

Code book	Legitimacy type	Temporality	Action/attribute	Description	Example quotations
Pragmatic	<i>Exchange</i>	<i>Short-term</i>	Action	Legitimate because the organization will gain materially from an action	“Sometimes we need data from the other departments. We do not have it all. So we need to ask the other departments to help us”—Malmö
	<i>Influence</i>	<i>Long-term</i>	Action	Legitimate because an action best serves an interest	“We have also engaged the environmental organizations in our local agreement. Because, I mean, they work with these kind of questions and we want to include them and also make it possible for them to scale up their work in different ways”—Gävle
	<i>Disposition</i>	<i>Long-term</i>	Attribute	Legitimate because action aligns with organizational values	“The reason we want this data is basically if we would the initiatives we do to try to support and promote sustainable lifestyles, we would like to like see what are the effects of those”—Göteborg
Moral	<i>Consequential</i>	<i>Short-term</i>	Action	The end-goals from an action are legitimate to pursue	“We, most Nordic cities, have very low direct emissions, so we have to take the next step. So we’ll see if they will take some action on that”—Stockholm
	<i>Procedural</i>	<i>Long-term</i>	Action	An action is legitimate owing to the means of attaining an end-goal	“What we try to do currently is that we try to work on the most impactful actions that we see that would make sense for the city; and that’s our current focus at the moment”—Bratislava
	<i>Structural</i>	<i>Long-term</i>	Attribute	The structure of the organization is suitable for an action to be successfully implemented	“You have no backing from higher governments. Results are limited. The results of our actions are a bit limited. Because you do not have the legitimacy”—Ghent
	<i>Personal</i>	<i>Short-term</i>	Attribute	Personal/individual qualities of the individuals implementing an action makes it legitimate	“It was my active colleagues and bosses that kind of bring it out that this is something that have to be taken into consideration and also kind of seeing is as the next step from the road map”—Tampere
Cognitive	<i>Taken-for-Granted</i>	<i>Long-term</i>	Action & Attribute	Legitimate because an action has been implemented previously or over a sustained period of time	“So we said we focus on scope one and two, that’s also because we signed the Covenant of Mayors. In the Covenant of Mayors, there is nothing mentioned about Scope 3, a ‘you may work on SCOPE 3, but you do not have to’—Antwerp
	<i>Comprehensible</i>	<i>Short-term</i>	Action and Attribute	Legitimate because an action is understandable	“But we did not have enough data or knowledge about what our indirect emissions are and what can we do to actually reduce them”—Oslo

Bernstein and Cashore (2007), in their study on the legitimization of non-state market driven initiatives, proposed a three-phase process from initiation, through widespread support, culminating (ideally) in political legitimacy. Combining insights from Bernstein and Cashore (2007) and Suchman (1995) suggests that the process of legitimization for non-state market driven initiatives might resemble that shown in Table 2. We fully recognize that urban CBCA is not a market driven initiative. Hence, the process outlined below served only as a starting point from which to develop the legitimization process for urban CBCA.

This two-part framework provides a structured approach to explore how urban CBCA might achieve political legitimacy. Here, we use this framework to analyze four distinct aspects of urban CBCA legitimization. First, we identify which types of legitimacy were present/absent in each city. Second, we define five legitimization phases according to legitimization agents, audiences, types of legitimacy and strategies used. Next, we determine which phase of CBCA legitimization each city studied has reached. Finally, we identify challenges and opportunities to build urban CBCA legitimacy in each phase. We find

that data play multiple roles in the legitimization of urban CBCA. As a social norm, access to data and clear methodologies makes urban CBCA seem plausible and predictable, often regardless of their quantity or accuracy. Where CBCA data and methodologies are not provided by higher levels of government, this form of cognitive legitimacy is often viewed as necessary to gain the political support required to access data and develop methodologies. So how do cities solve this chicken or egg problem? We discuss the different roles of metrics, position legitimization pitfalls, and identify pathways towards political legitimacy for CBCA.

3 Materials and methods

This study is based on qualitative data collected through semi-structured interviews with key municipal representatives from 17 European cities: Antwerp, Bratislava, Lahti, Paris, Gävle, Gothenburg, Strasbourg, Tampere, Ghent, Helsingborg, Malmö, Oslo, Reykjavik,

TABLE 2 Typology of urban consumption-based carbon accounting (CBCA) legitimacy sources.

	Initiation	Widespread support		Political legitimacy
Legitimizing audience	Limited constituencies	Broader constituencies	Constituencies and observers	Constituencies and observers
Main type of legitimacy	Pragmatic	Pragmatic	Moral	Cognitive
Legitimation strategies	Select environments	Conform to environments	Manipulate environments	Maintain and enhance legitimacy

TABLE 3 Urban CBCA adoption and transnational network membership status for the 17 European cities studied.

City	Status of CBCA adoption	EU member	100 cities mission	C40 members
Antwerp (Ant)	No adoption, exploration of the possibilities	Yes	Yes	No
Bratislava (Bra)	No adoption, no exploration	Yes	Yes	No
Espoo (Esp)	Adoption of CBCA without numerical target (commitment through the climate plan to work on CBCA)	Yes	Yes	No
Gävle (Gav)	Adoption of CBCA with precise goal—net zero territorial and consumption-based emissions by 2035	Yes	Yes	No
Ghent (Ghe)	No adoption of CBCA, exploring the possibilities	Yes	No	No
Goteborg (Got)	Adoption of CBCA with precise goal—3.3 T of carbon per person by 2030	Yes	Yes	No
Helsingborg (Hel)	Adoption of CBCA with precise goal—consumption-based emissions align with the Paris Agreement, with partial target by 2030	Yes	Yes	No
Lahti (Lah)	Adoption of CBCA without numerical target (commitment through the climate plan to work on CBCA)	Yes	Yes	No
Malmö (Mal)	Adoption of CBCA with precise goal—reduce Scope 3 emissions by 50% from 2019 to 2030	Yes	Yes	No
Oslo (Osl)	Adoption of CBCA without numerical target (commitment through the climate plan to work on CBCA)	No	Yes	Yes
Paris (Par)	Adoption CBCA with precise goal—carbon neutral by 2050 (including consumption emissions)	Yes	Yes	Yes
Reykjavik (Rey)	No adoption of CBCA, exploring the possibilities, sectoral target on buildings	No	Yes	No
Strasbourg (Str)	Adoption of CBCA without numerical target (reference in the climate plan that Scope 3 is important)	Yes	No	No
Stockholm (Sto)	Adoption of CBCA with precise goal—reduce consumption-based emissions by 50% by 2030	Yes	Yes	Yes
Tampere (Tam)	Adoption of CBCA without numerical target (commitment through the development program to work on CBCA)	Yes	Yes	No
Trondheim (Tro)	No adoption of CBCA, taking action	No	Yes	No
Valladolid (Val)	No adoption of CBCA, exploration of the possibilities	Yes	Yes	No

Trondheim, Valladolid, Stockholm, and Espoo. The characteristics of these cities are summarized in [Table 3](#).

To identify the best-suited participants to the study, the authors first used the NetZeroCities Portal (NetZeroCities, 2025), using keyword-based filtering, including the terms “neutral,” “carbon,” “accounting,” “decarbonization,” and “GHG.” Additional participants were recruited during the European Resilience Forum (European Urban Resilience Forum, n.d.) held in Valencia in June 2024. In total, 80 people were initially shortlisted as potential participants. Based on their reported involvement in carbon accounting and their knowledge of CBCA, 28 people were contacted by email. In total, 17 semi-structured interviews were conducted between July and September 2024. It should be observed that these interviews concerned the overall governance barriers to the adoption of CBCA and did not solely focus on legitimacy. All the interviewees held strategic positions in the department in charge of carbon accounting, typically the Sustainability Department or its equivalent. In some cases, participants were directly responsible for Scope 3 emissions. In most cases, they worked on the city’s overall carbon reduction strategy. Interviews lasted on average 43 min and were conducted online. More information about the interviews can be found in [Supplementary Annex 1](#). Interview data was transcribed automatically

and manually verified. Relevant quotations were uploaded to a spreadsheet that was used for deductive coding.

Two phases of deductive coding were conducted. Each phase was conducted independently by two researchers to ensure intercoder reliability. In total, 450 interview excerpts were coded according to the three main legitimacy categories: pragmatic, moral, and cognitive, and nine specific legitimacy types. Each code indicates that a city either leveraged a specific type of legitimacy to support CBCA implementation or expressed a need to strengthen that form of legitimacy to further develop CBCA-related policies. Following the first phase of qualitative coding, a quantitative analysis of the 450 unique quotations was conducted. The data was duplicated and sorted by city to allow for the observation of legitimation patterns across locations. Legitimacy codes were sorted by overall type: pragmatic, moral and cognitive. Groupings were calculated through the sum total of the corresponding prevalence of each form of legitimacy. The second coding phase identified which agents legitimated CBCA, to which audiences, using which strategies, at what point in time. Through an iterative process, legitimation phases were defined, and cities were associated with them. Common barriers and enablers allowing cities to progress from one legitimation phase to the next were also identified.

4 Results

This section presents the key findings with respect to the legitimization of urban consumption-based carbon accounting (CBCA) across the 17 European cities studied.

4.1 Types of legitimacy

As previously mentioned, 450 interview excerpts were coded according to the three main legitimacy categories: pragmatic, moral, and cognitive. Cognitive legitimacy was the most frequently cited, accounting for 201 quotes (45.7%). Moral legitimacy followed with 30.2%, and pragmatic legitimacy accounted for 24.1% of the total. While these percentages provide an overall picture, they do not reflect the relative importance of each type of legitimacy across the different cities. To draw conclusions, a city-specific analysis is necessary. The distribution of moral, pragmatic, and cognitive legitimacy codes for each city is presented in Figure 1.

This graph also shows that no city relies exclusively on one or two legitimacy categories. Rather, all three legitimacy categories are necessary to support urban CBCA's legitimacy. In all cities, cognitive legitimacy emerges as the most prevalent legitimacy category, driven by the need for CBCA approaches to be understandable for both internal and external audiences in relation to social norms and practices. The desire for CBCA to ultimately be “taken-for-granted”—the other dimension of cognitive legitimacy—is also present in all cases, though it was mentioned far less frequently.

Pragmatic legitimacy, across the interviews, is approached mainly through dispositional legitimacy. This implies that CBCA needs to be aligned with the municipal values to be considered legitimate. The two other pragmatic dimensions; ‘Exchange’ (i.e.,

expected material benefits from CBCA) and ‘Influence’ (i.e., CBCA is deemed legitimate for serving stakeholder interests) typically represent one quarter of the citations each.

With respect to moral legitimacy, the data shows a relatively balanced distribution across all four subtypes: ‘Personal’ (29.3%), ‘Consequential’ (28.5%), ‘Structural’ (21.8%), and ‘Procedural’ (20.3%). Notably, the ‘Personal’ code is mentioned in every city. These quotes highlight the leadership role of municipal practitioners in driving CBCA efforts.

Despite the prominence of cognitive legitimacy, the distribution of legitimacy types varies substantially from city to city, indicating different local needs and strategies for legitimizing CBCA. To better capture these variations, the cities were grouped into four categories based on the dominant configurations of legitimacy observed: (1) cities with a primarily cognitive focus, (2) cities with a cognitive and pragmatic focus, (3) cities with a cognitive and moral focus, and (4) cities with a balanced focus across all three types. The resulting categorization is illustrated in Figure 2.

Tampere and Trondheim emerge as cities with a primarily cognitive focus. Their emphasis, as detailed above, relies on comprehensibility—developing a clear understanding of Scope 3 emissions, building reliable data baselines, and ensuring methodological clarity. In Tampere, for example, stakeholders stress the importance of collecting context-specific information through surveys and direct engagement with residents to counterbalance the lack of consumption-based emissions data:

“We want to go near to people and also make our work based on the information that we have gathered from the people and by interviewing and meeting people in the events. And we have also made a questionnaire and kind of. Not to base our work on assumptions but more like understanding that people are different and areas are different.” (Tam).

City Legitimation Codes

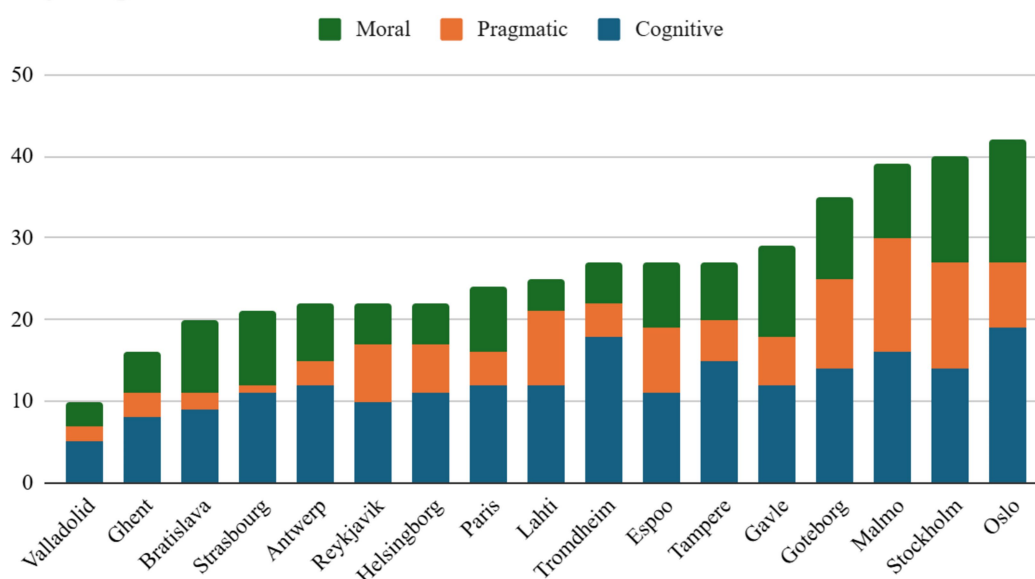


FIGURE 1
Distribution of moral, pragmatic and cognitive codes for each city.

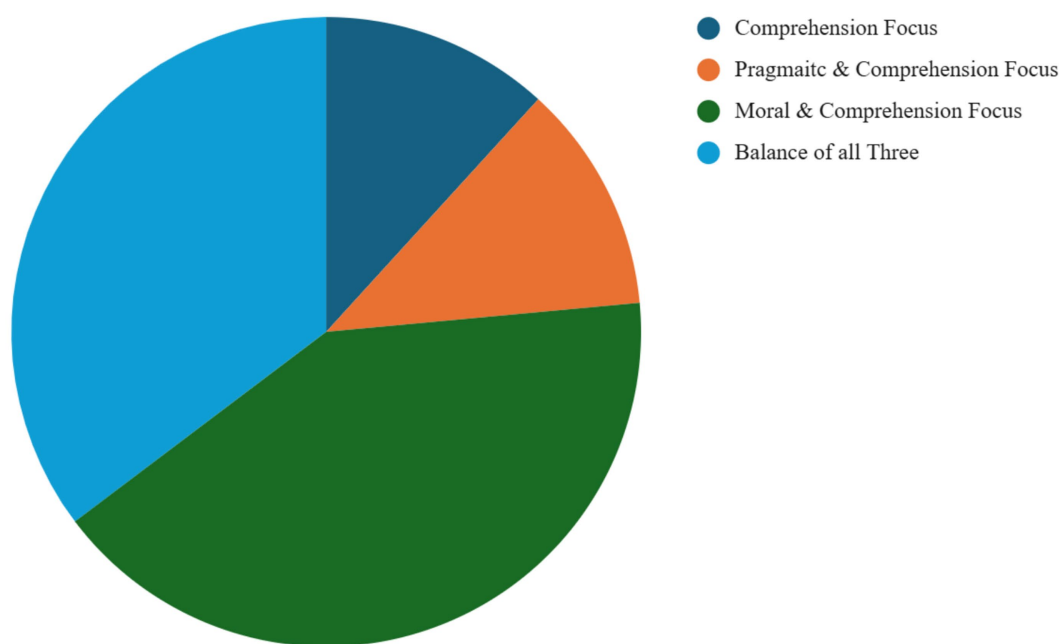


FIGURE 2
Proportion of cities in each legitimacy group.

Lahti and Reykjavik demonstrate a combination of cognitive and pragmatic legitimacy. Alongside the need to understand and justify CBCA conceptually, these cities also emphasize the material or strategic benefits of carbon accounting. Their discourse reflects both an internal drive for understanding and an external orientation toward demonstrating the value of CBCA to stakeholders, whether through direct benefits or broader influence in policy arenas. For example, in Lahti, this comprehension need is reflected in the challenge of navigating complex models:

“But for the scope 3 emissions, I do not have the knowledge or the capacity to really know it. And the more I learn about it, the more [...] I would like someone else to do it. Because I mean, when you get to the food sector or the goods and services [...] you need to understand the extended economy and the models get more complicated.” (Lah).

In Reykjavik, pragmatic legitimacy is reflected in the “influence” dimension, with references to the city’s leadership role in climate action and political engagement through initiatives like the Covenant of Mayors: “Well, and actually because we are a part of Covenant of Mayors and also political interest into the subject, were made estimation of the inventory every other year until 2019.” This pragmatic orientation extends to interactions with the private sector, particularly in the building materials industry: “But it’s of course more complicated than that. We have to involve the private sector as well. And they are actually, just so you know it, because it has been a huge interest actually in the building materials and the building sector.” (Rey).

In Lahti, pragmatic legitimacy is also visible through the “exchange” dimension, particularly in relation to food emissions accounting and partnerships with local businesses: “And I think they were already doing some kind of carbon accounting based on the like,

on the food, on the carbon footprint from the food that is also available for the customers. They have this app where you can check the carbon footprint of your, of all the items you bought [...]. We have a system called the Climate Partnership, so we have at the moment I think maybe 30 local companies that our other organizations that are partnering the city and they have their climate work. And that is a group that wants to reduce their emissions. As for many of them, it’s also about the scope 3 emissions” (Lah).

The third, and most prominent pattern, is the combination of cognitive and moral legitimacy. This pattern is evidenced by Antwerp, Oslo, Strasbourg, Valladolid, Paris, Bratislava, and Gävle. In these cases, CBCA is seen not only as a technical imperative but also as a normative obligation. CBCA is something that must be pursued because it is ethically right or aligns with broadly shared sustainability objectives. These cities often justify actions related to CBCA through appeals to fairness, responsibility, or future-oriented governance, in parallel with the need for methodological and conceptual clarity. For example, an Oslo municipal official highlighted the responsibility of the municipality in driving consumer choices: “And it cannot be up to the person itself to decide like should I try go for this or that? That decision should be already like made. A decision that is the easiest should also be the best. And that’s the politicians responsibility” (Osl). Similarly, in Strasbourg, CBCA is framed as a logical step to address the carbon footprint of the city: “In other words, as long as we are only talking about Scope 1 and 2, and as long as we only have a territorial strategy on these perimeters, we are missing out on a strategy that would enable us to reduce the carbon footprint of the region and its inhabitants, particularly in terms of food strategies” (Str).

Finally, the last group—Stockholm, Espoo, Helsingborg, Malmö, Ghent, and Goteborg—displays a balanced legitimacy profile, with a relatively even distribution of pragmatic, moral, and cognitive arguments. These cities reflect a more integrated legitimization

approach, acknowledging technical needs, normative drivers, and instrumental concerns simultaneously. Balanced legitimacy profiles tend to occur in cities that have been engaging in CBCA intensively or over a longer period of time.

4.2 Legitimation phases

The above analysis suggests that the sources of legitimacy sought and legitimation strategies used change as cities' engagement with CBCA matures. Data suggest five CBCA legitimation phases: (1) exploration, (2) initiation, (3) internal widespread acceptance, (4) external widespread acceptance, and (5) political legitimacy. Table 4 summarizes the characteristics of each phase and positions the 17 cities under study with respect to these phases. Most cities are pursuing internal and external widespread acceptance for CBCA

practices. Paris stands out as the only city where CBCA has achieved a certain degree of political legitimacy.

4.2.1 Exploration: Antwerp, Bratislava, Ghent, Valladolid

The exploration phase refers to initial engagement with urban CBCA. Exploration typically involves learning about CBCA through information and data gathering. In most cities, including ones having moved on to later legitimation stages, the impetus for urban CBCA is attributed to municipal practitioners who act as the primary legitimating agents. *"I do not think [CBCA] came from the politicians. I think it came from the city staff, the civil servants."* (Lah) *"It was my active colleagues and bosses that kind of brought it out that [CBCA] is something that has to be taken into consideration."* (Tam) Legitimation efforts are directed mainly towards practitioners within departments responsible for emissions accounting.

TABLE 4 Five CBCA legitimation phases and their characteristics.

Legitimation phase	Exploration	Initiation	Internal widespread acceptance	External widespread acceptance	Political legitimacy
Main legitimacy categories	Moral legitimacy and need for cognitive legitimacy		Increasing importance of the pragmatic legitimacy		Cognitive legitimacy
Main legitimacy types	Comprehensibility (absent)	Exchange comprehensibility (limited)	Personal exchange comprehensibility (moderate)	Influence dispositional comprehensibility (nuanced)	Dispositional taken-for-granted
Temporal legitimacy focus	Short-term legitimacy	Short-term legitimacy	Short-term legitimacy	Balanced interest in short-term and long-term legitimacy	Converting short-term into long-term legitimacy
			Long-term legitimacy (increasing)		
Focus on actions or attributes	No clear focus Municipal practitioners	Focus on actions	Focus on actions	Balanced focus on actions and attributes	Balanced focus on actions and attributes
Primary legitimating agents		Municipal practitioners	Municipal practitioners	Municipal practitioners	All levels of government
		CBCA experts	CBCA experts	CBCA experts	Constituency stakeholders
National government (France, Finland, Sweden)			Local politicians National government (France, Finland, Sweden)		
Primary legitimating audiences	Municipal practitioners responsible for carbon accounting	Municipal practitioners in other departments	Municipal practitioners in other departments	Observer stakeholders	Observer stakeholders
		Local policymakers	Constituency stakeholders	Citizens	Citizens
			Local politicians		
Legitimation strategies	Conforming to environments	Manipulating environments	Selecting environments	Selecting and manipulating environments	Conforming, selecting, and manipulating environments
Cities in each phase	Antwerp	Lahti	Reykjavik	Espoo	Paris
	Bratislava	Tampere (post-election)	Strasbourg	Gävle	
	Ghent		Tampere (pre-election)	Goteborg	
	Valladolid			Helsingborg	
				Malmö	
				Oslo	
				Stockholm	
				Trondheim	

During exploration, CBCA comprehensibility is desired but absent. In Bratislava and Valladolid, where CBCA is not considered a municipal concern, representatives emphasize the need to justify CBCA in terms of their impacts. “[Politicians] care about what their electorate is interested in, and the electorate is interested in solving the current issues that they have problems with. They do not care about long-term stuff” (Bra). “[We] should be able to explain very clearly what are the benefits and what must be the strategy.” (Val) At the same time, these cities emphasize their structural and procedural inability to access data and implement complex calculation methodologies. This focuses attention on actions that can be legitimated consequentially, in terms of their impacts. “What we try to do currently is that we try to work on the most impactful actions that we see that would make sense for the city; and that’s our current focus at the moment” (Bra) However, this focus on consequential legitimacy creates a chicken-or-egg problem because the data needed to legitimate CBCA cannot be collected until CBCA is legitimated.

4.2.1.1 Barriers to CBCA exploration

Limited CBCA exploration is justified because it conforms to existing environments. For example, the Covenant of Mayors does not require that Sustainable Energy and Climate Action Plans address Scope 3 emissions. Moreover, municipal emission reduction targets rarely include Scope 3 emissions. Hence, both targets and standards make focusing exclusively on Scopes 1 and 2 comprehensible in terms of existing practices and standards. In Bratislava, these effects are compounded by fossil fuel lobbies that discourage climate change efforts beyond those explicitly mandated by the European Union.

The absence of accurate data and clear calculation methodologies is also used to justify inaction with respect to consumption-based emissions. “We put goals of scope 1 and 2 as precise as we could. But we will not do this on scope 3 as, six years ago when we looked into it, it was pretty difficult to make a more or less correct assumption.” (Ant) These three barriers to CBCA legitimacy interact. According to the municipal representative from Ghent, political interest is low because Scope 3 is not calculated. Scope 3 emissions are not calculated because of data and methodological complexity, and without political interest there are no resources available to develop the methodology (procedural legitimacy), calculate potential impacts or monitor outcomes (consequential legitimacy).

These conditions justify limited resource allocations to emissions accounting. Limited resources, in turn, fuel perceptions that municipal government is neither capable nor the right entity to explore CBCA. “If I would have, you know, five more colleagues maybe, in two years, we would focus on this. But currently, I do not see [CBCA] as a priority anytime soon” (Bra). In Valladolid, financial constraints were associated with difficulties in ensuring that CBCA was calculated properly (procedural legitimacy) and emission reductions were monitored adequately (consequential legitimacy). Consequential and procedural legitimacy are often viewed as prerequisites for structural legitimacy. In other words, determining whether CBCA should be implemented depends on calculations of potential outcomes based on sound methodologies and urban capacities. These perceptions of low structural legitimacy, when held by municipal practitioners, can stifle exploration. Even when CBCA champions exist, exploration is challenging. “You have no backing from higher governments. The results of our actions are a bit limited, because you do not have the legitimacy” (Ghe).

4.2.1.2 Strategies to overcome barriers to CBCA exploration

In the absence of supportive environments to conform to, some cities select environments whose objectives align with CBCA. One such environment is composed of actors committed to circular economy principles. Framing CBCA as contributing to regional circular economy objectives bolstered the consequential legitimacy of CBCA in Antwerp. This connection between CBCA and circular economy was also found in a number of the Scandinavian cities studied: Tampere, Goteborg, Oslo, Reykjavik, Trondheim, and Malmo. Rather than stressing the impacts of CBCA, it appears that the circular economy discourse contributes to cognitive legitimacy by making CBCA seem inevitable and its implementation at the municipal level plausible. “There are plans now on how to include a circular economy into Reykjavik. So that is maybe the first steps into reducing Scope 3 emissions. Even if they are not getting measured yet. We do not have the data so.” (Rey) This quote shows how the circular economy can create a cognitive bridge that reduces the need for accurate data. Using circular economy to explain what CBCA is and why it matters, can be a powerful alternative to demonstrating what it achieves.

4.2.2 Initiation: Tampere, Lahti

Exploration gives way to initiation when the municipal administration recognizes that CBCA merits further investigation. Additional financial and human resources are dedicated to data collection and analysis. These activities aim to enhance the perception that urban consumption-based emission policies will be data-driven and monitored. During initiation, legitimation efforts aim to build a case to convince local politicians of the value of pursuing CBCA.

Initiation involves engagement with CBCA data collection and calculation methodologies. Due to the inherent complexities of these processes, initiation activities are often guided by external experts from consulting firms or research institutes. These experts bolster consequential legitimacy by evaluating urban consumption-based emissions and potential reductions. Experts can also enhance procedural legitimacy by relying on accepted CBCA methodologies and structural legitimacy by building municipal capacity to conduct CBCA calculations and implement associated measures. When successful, initiation often results in urban commitments to address CBCA. These commitments often appear in local Climate Plans that, in turn, justify more concrete actions.

While external expert involvement may be necessary, it can act as a double-edged sword. For expert consultants, CBCA holds exchange legitimacy because its adoption comes with the promise of future contracts. The representative from Lahti warned that overreliance on experts can undermine future municipal structural and procedural legitimacy. “When we order this type of report or inventories from consultants, it is often the case that they do not wanna share all the data because that’s their business [...] If they would give us all the data then we would be able to do it ourselves.” (Lah).

4.2.2.1 Barriers and enablers to greater CBCA legitimacy

Moving from initiation to widespread acceptance requires ongoing political support. While initiation focuses on making CBCA comprehensible to local policymakers through facts and figures, research participants highlight that CBCA’s legitimacy depends on individual perceptions largely outside their control. CBCA efforts can easily be derailed by “the new elderman and new mayor saying: No, we do not

go into that direction, we simply stay with Scope 1 and 2.” (Ant) Divergences between data-based recommendations and political support fosters frustration in cities like Lahti where practitioners are “trying to provide [policy makers] data [...] So far, it did not change their minds.” (Lah) The flip side of this problem is that local policymakers can also act as CBCA champions. Cities that have reached the phase of widespread acceptance tend to have political champions. For example, in Strasbourg “there’s still a vision among our elected representatives who are quite supportive on the subject.” (Str). The full extent of the legitimating power of urban CBCA champions is exemplified by Anne Hidalgo, the former president of C40 Cities, who as mayor of Paris helped maintain strong engagement on climate, including through CBCA.

Tampere is a good example of what happens when political support for CBCA is lost. Tampere had 15 municipal officials working on climate issues, half of which focused on carbon accounting. They were reducing consumption-based emissions through municipal food procurement, reaching out to private companies to encourage product emission disclosure, and developing awareness programs for citizens. In other words, Tampere was building internal and external widespread acceptance. However, following the Finnish national elections in 2024, state funding for these efforts was cut, sending Tampere back to the initiation phase. While Espoo raised similar concerns, their CBCA efforts are largely funded by the EU, protecting their efforts from changes in national political support.

4.2.3 Internal widespread acceptance: Strasbourg, Reykjavik

The phase of widespread acceptance is divided into two parts. Internal widespread acceptance of CBCA is limited to gaining legitimacy within municipal government and acting to reduce consumption-based emissions from municipal activities. External widespread acceptance extends CBCA legitimation to the broader urban economy. While these are shown as distinct phases, with internal legitimacy preceding external legitimacy, they often evolve in parallel. In these phases, pragmatic legitimacy plays a bigger role as engagement in CBCA practices intensifies and makes benefits and burdens more apparent and immediate.

Internal widespread acceptance is typically achieved by selecting environments through public procurement. Public procurement represents a concrete mechanism through which cities can reduce their own consumption-based emissions. However, to leverage procurement, procurement staff must be convinced of the need to address CBCA and change their established practices accordingly. Initial buy-in is secured through a clear mandate to address municipal consumption-based emissions, institutionalized in the initiation phase. Over time, new practices are formalized through sustainable procurement guides and purchasing platforms. “We’re cooperating with our procurement office in the municipality. [...] For example, right now when you purchase through our travel platform, then you will be asked: OK, is this trip necessary?” (Tro).

Industries connected to public procurement become targets of CBCA legitimation strategies, alongside sectors such as schools, where cities typically retain direct control. The acceptance of CBCA procurement requirements by industry actors is based on exchange legitimacy. Complying with new requirements is the cost of benefiting from municipal contracts. Which sectors are targeted depends on the procurement activities of specific cities. In Finland, municipalities are responsible for food procurement for schools, kindergartens, and elderly care facilities. Travel and fuels are tackled in Trondheim and Galve,

respectively. Building and infrastructure projects are identified as particularly powerful means to reduce consumption-based emissions. However, these projects are deemed more complex, involving a wider range of actors. Accordingly, the consumption-based emissions of construction projects are typically tackled in the later stages of internal widespread acceptance. Of the cities studied, consumption-based building emissions are addressed only by Goteborg, Reykjavik, Oslo, and Paris.

4.2.3.1 Challenges and opportunities for internal widespread CBCA legitimacy

Internal widespread acceptance implies mainstreaming CBCA to other municipal departments. Several research participants indicated that, as the number of legitimacy audiences increases, so does the potential for tensions. Or, as Suchman would call them, inconsistent environments. In Strasbourg, internal inconsistencies were associated with differences in disciplinary knowledge and cultures. Internal conflicts also arise when existing municipal priorities are perceived as incompatible with CBCA. The representative from Tampere summarized this situation as follows: “There’s individual people, and also departments, that see that [CBCA] is important. But always, when you have to prioritize, it might be that because there is no [obligation], there’s other things that have to be done.” (Tam) In Stockholm “the main resistance is [...] a conflict between different interests. For instance, if we try to reduce the use of plastic and single use products like plastic gloves and stuff like that, it comes in conflict with the actual operations and safety rules.” (Sto).

These conflicts undermine CBCA’s legitimacy in three main ways. First, they can make CBCA seem incomprehensible with respect to established practices. Second, when the existing practices are associated with fundamental values, such as health and safety, their incompatibility with CBCA can call into question the latter’s dispositional legitimacy. Third, if CBCA actions are viewed as negatively impacting performance with respect to other objectives, CBCA’s consequential and influence legitimacy may also be at stake.

These challenges can be overcome by making CBCA mandatory through specific metrics or integrated governance approaches. Metrics include adopting Scope 3 emission targets, including Scope 3 in accepted methodologies, or as part of the recommendations of transnational climate networks. “It would make it much easier for all signatories to the Covenant [of Mayors], if they would make Scope 3 somehow mandatory.” (Ant) Stockholm and Oslo are adopting an integrated approach. They actively work on priority alignment “We have to work a lot in internal networks and on different levels. [...] You have to think of it as multilevel governance, also internally in the city, to make people meet each other.” (Sto) Both break down siloes by making all departments responsible for reducing consumption-based emissions. In Stockholm “every department has a responsibility to report in our management system. But often they contact the specialists in the Environment Department to get help on how to do it. But the responsibility is on each and every one of them.” (Sto) Oslo’s climate budget embeds climate considerations into all budget decisions. It prioritizes measures that reduce emissions, identifies the costs, assigns responsibilities to implementing agencies and helps hold them accountable.

4.2.4 External widespread acceptance: Espoo, Gavle, Goteborg, Helsingborg, Malmo, Oslo, Stockholm, Trondheim

External widespread acceptance poses additional legitimation challenges. During external widespread acceptance, urban CBCA

begins to affect firms and individuals who do not stand to benefit from transactions with municipal governments. Hence, initiatives aiming to reduce consumption-based emissions give rise to more pointed questions about how burdens and benefits are calculated, distributed, and monitored.

Of the case studies, only Scandinavian cities reached this phase. The trend of increasing attention to pragmatic legitimacy continues. In Trondheim, Helsingborg, Galve, and Espoo, influence legitimacy gains in importance since legitimating audiences do not benefit from exchange legitimacy. Rather, their interests lie in broader benefits to the community. At this stage, cities begin building communities around CBCA and begin promoting CBCA through existing environmental organizations. *“It was political, but the process involved actually also external, civil society, and all the different parts of the municipality, companies, and it was a very broad process.”* (Gav) In cities tending towards political legitimacy—Goteborg, Malmo, Oslo, Stockholm—dispositional legitimacy became more dominant through references to CBCA's alignment with urban values. These results suggest that the external widespread acceptance phase marks two distinct shifts. First, cities shift from focusing on short-term legitimacy to a more balanced interest in short- and long-term legitimacy. In the more advanced cities, we observe a second shift from legitimacy associated with actions to legitimacy based on attributes. These shifts can be understood as responses to specific CBCA legitimacy challenges.

4.2.4.1 Challenges to external widespread CBCA legitimacy

Most cities emphasized that citizens resist policies that affect their lifestyle choices. This resistance makes policy makers uneasy about supporting initiatives related to consumption behaviors. *“There is a very strong notion that people should be free to choose their lives and do what they want with their money. So, it's difficult for politicians to bring forward the message that you should not fly abroad, or you should not buy large boats or whatever.”* (Sto) These types of decisions cannot be supported by data alone. *“There's a big lag between what we do and the effects we see of them. It can be difficult to get politicians rallied up behind those kinds of efforts.”* (Got).

Faced with these difficult decisions, cities often question their dispositional legitimacy. To what extent do cities have the authority to impose CBCA measures that limit organizational or personal freedoms? This struggle is exemplified by the reflection expressed by the representative of Malmo's. *“I'm not sure if we are the right actor to actually criticize people [...] I think it's very difficult, even though we can see that [travel] is one of the bigger issues and we need to change our travel behaviors.”* (Mal) Cities that have overcome this barrier have done so by associating CBCA with broader issues of social justice. Taking responsibility for problems of distributive justice is becoming an urban value. *“The rich world is causing the trouble, and the poor world is affected by it. We see that exists also in our city, not just on the global level.”* (Sto). In Goteborg *“we started to look more actively and framing [CBCA] as a justice issue.”* (Got) *“It's very important that big cities and especially in the rich countries take responsibility for their emissions that occurs outside the boundary”* (Oslo).

4.2.5 Political legitimacy: Paris

Paris is the only city studied where CBCA has achieved a certain level of political legitimacy. To be clear, CBCA is yet to have full political legitimacy. However, the majority of urban actors in Paris

view CBCA rules as appropriate and an urban Scope 3 emissions target has been set. CBCA's legitimation rests on a solid historical foundation of urban climate leadership. Paris had a climate plan long before it became a national requirement. Hence, the structural legitimacy of Paris as the implementer of innovative climate actions is well established. The signature of the Paris Agreement, where 195 countries and the European Union committed to decarbonize their economies by 2050, layered top-down political will over existing bottom-up initiatives. Linking CBCA to achieving decarbonization, an idea brought to the world by the French government, makes CBCA seem not only plausible but inevitable.

CBCA's legitimacy is rarely questioned. This is not to say that stakeholders agree to all consumption-based measures. However, instead of lobbying for or against CBCA, stakeholders advance their interests through CBCA, viewed as an arena for developing and contesting standards. In Paris, numerous programs and financing mechanisms have been developed to incentivize local, low-carbon alternatives. For example, dedicated funds encourage the use of biobased materials in construction and training bolsters the production of local food and its consumption in Parisian schools and restaurants. These urban initiatives complement the standardized data and calculation methodologies provided by the French government. CBCA data is provided by INSEE, the national statistical institute. The French Agency for Ecological Transition (ADEME) developed the *Bilan Carbone* methodology. The representative from Paris emphasized the importance of these institutional arrangements for procedural and consequential legitimacy. *“It's good to have in France this “Bilan Carbone” methodology, because then every city would use the same rate for emissions. So it gives more legitimacy as well for these figures.”* (Par) Despite this strong moral foundation structural, consequential, and procedural legitimacy can always be improved.

4.2.5.1 Combining strategies to maintain and strengthen political legitimacy

Debates surrounding CBCA focus mainly on how to enhance data efficiency, accuracy and transparency. Many responses from the Paris representative highlighted ongoing limitations of existing CBCA practices. *“There's a lack of emissions factors for Scope 3. It's not accurate enough”* *“The main issue is data collecting. Especially for goods, we do not have a right database”* (Par) Publicly acknowledging these limitations serves two purposes. First, by being transparent about CBCA shortcomings the municipal government of Paris builds trust with respect to its actions and goodwill. Second, by highlighting future procedural improvements, Paris positions itself as a leader in long-term efforts to perfect CBCA. This positioning is vital for manipulating broader institutional environments.

Paris is working hard to extend CBCA's legitimacy within and beyond urban boundaries. Within the city Paris is manipulating environments through education and awareness programs. These programs help embed CBCA within the culture. Awareness efforts are strategically positioned to target younger citizens and turn them into legitimating agents. *“The mayor wanted to make it a place for young people to get answers on the climate crisis, and to act, and to raise awareness as well. So they have programmes with schools, with students.”* (Par) Corporate culture is being manipulated through the *Pacte Action-Climat-Biodiversité*. By singing, stakeholders agree to work with the city to reduce its carbon footprint. *“We have big energy companies for gas, for electricity, for electric transportation. [...] We have*

small restaurants and bigger ones. And the idea is to embark all of them and to share experience and good practices between all of them. We have a lot of people from buildings. Social landlords, city planners, and building investors, and constructors.” (Par) On a grander scale, Paris has positioned itself within the C40 group of cities. “We have a European project as well to work on with some other cities like Amsterdam and it’s called INTEREG to include more carbon objectives within procurement. We have a plan as well on this issue.” (Par).

While these efforts have been successful, the Paris representative emphasized that the city lacks the regulatory powers necessary to target certain sectors. For example, air pollution limits for vehicles are set at the national level, emissions from inter-city travel are regional or international, and thus largely outside municipal control. It is interesting to note that, while many cities in the external widespread acceptance phase questioned their legitimacy to restrict individual choices, these concerns were absent from the discourse in Paris. Paris appears to be skillfully combining different legitimization strategies. It is conforming with national standards for cognitive and procedural CBCA legitimacy, selecting cities to extend CBCA’s political legitimacy beyond the city limits, and manipulating global CBCA methodologies to ensure its legitimacy as a CBCA leader over time.

5 Discussion: the many roles of data in CBCA legitimization

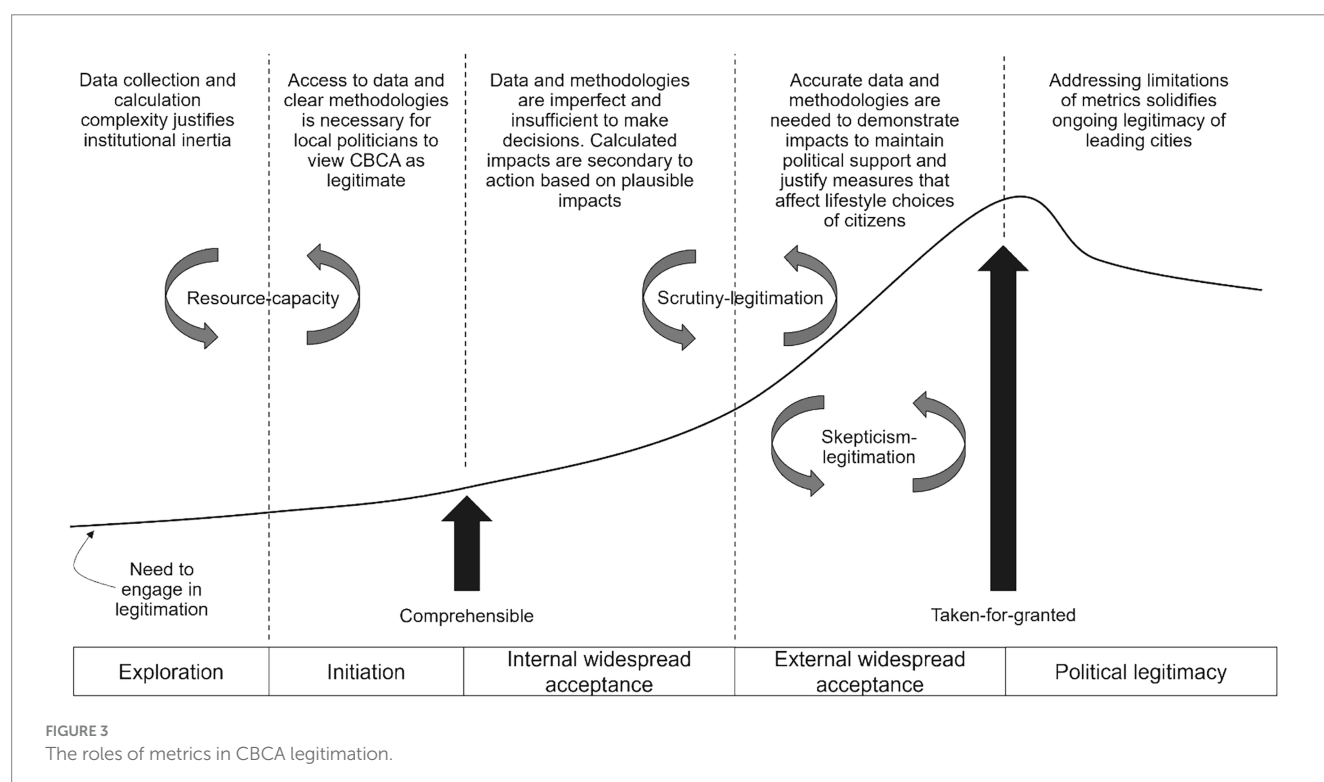
Throughout the urban CBCA legitimization process, data and calculation methodologies play an important role. As suggested by Sareen (2020), metrics do not just measure reality, they actively shape it. In the case of CBCA, we find that the role of metrics differs in each legitimization phase. The evolution of cognitive legitimacy, in particular, impacts the importance attributed to metrics in the legitimization of

CBCA. Figure 3 illustrates changes in demands to engage in CBCA legitimization and positions the different roles of metrics with respect to legitimization phases.

In the absence of cognitive legitimacy for CBCA, the complexity of data collection and calculation legitimates institutional inertia. The discourse around CBCA inaction reflects Ashforth and Gibbs (1990) resource-capacity legitimization cycle, whereby limited legitimacy results in limited resources for engagement in legitimization, including through data collection and analysis. This vicious cycle remains an issue even when CBCA has achieved higher levels of legitimacy, as expressed by Oslo “We have a bit more difficulties to get money to projects when we cannot say, this is the actual emission reductions from it.” (Oslo) In these cases, however, resource and capacity constraints do not strictly preclude action because CBCA is comprehensible in relation to existing standards or practices.

Comprehensibility can be top-down, bottom-up, or bilateral. Top-down comprehensibility results from CBCA legitimization by higher level government. In France, Sweden, Norway, and Finland, governmental support was accompanied by the provision of consumption data and calculation methodologies. Making these methods and metrics available addresses many of the technical barriers mentioned above. Moreover, clear mandates to address consumption-based emissions reduce resistance from municipal practitioners and local politicians. This multilevel alignment in support of CBCA also reduces the perceived need for high quality data to make a case for action. CBCA is associated with an understanding that “Climate change is happening, and it’s one thing that is very important that the politicians are addressing.” (Oslo) Consequently, cities benefiting from top-down comprehensibility spend little time in exploration and initiation and quickly look to build widespread acceptance.

Bottom-up comprehensibility takes more time to establish. Cities struggling to move from initiation to widespread acceptance typically



view robust metrics as necessary to convince local politicians of the value of engaging in CBCA practices, including through data collection. To bypass this problem, cities construct comprehensibility by associating CBCA practices with progress towards other institutionalized urban goals. Here, urban Climate Action Plans serve as anchors. Several cities justified CBCA in terms of its contributions to circular economy principles, local economic development, or as the next logical step based on established roadmaps.

CBCA comprehensibility can also be supported through transnational city networks (e.g., C40, Covenant of Mayors, 100 Cities Mission). While it is tempting to jump to the conclusion that these networks contribute to CBCA comprehensibility, we find that this is not true under all conditions. Instead, we see that differences between metrics recommended by networks and those used by national, regional or local governments can pose challenges to CBCA comprehensibility based on a perception of data availability and set methodologies. For example, differences in the base year recommended by the Covenant of Mayors (European Commission, 2024) and that used for regional CBCA baselines in Flanders, delegitimated regional data in the eyes of municipal practitioners in Antwerp, preventing the city from benefiting fully from top-down cognitive legitimacy. Similar issues exist when cognitive legitimacy is built from the bottom-up. As indicated by Mirabella and Allacker (2021), methodological differences call into question the objectivity of data and the validity of data-driven policy decisions, given the potential for conflicting policy recommendations (Ottelin et al., 2019). These concerns make it harder to argue that CBCA practices will help accomplish local objectives.

The establishment of CBCA comprehensibility marks an inflection point. Once CBCA becomes comprehensible, metrics become secondary to actions. In the early stages of internal and external widespread acceptance, respondents largely accept that data and methodologies are imperfect and insufficient. Concerns raised include the lack of data granularity, accuracy, and timeliness. *“We thought that if we would have more data, we would also perhaps have more power to facilitate the change. [...] We have not really utilized the data available in the decision making yet.”* (Lah) At this stage, decision-making is guided, not by mathematical projections, but by broader understandings of the main sources of consumption-based emissions. *“Even though we did not have accurate data, we know the big sources of our emissions.”* (Oslo) In Ghent, *“everybody knows that, when it comes to becoming climate neutral, [efforts] should be going on housing, transport and food. Everybody knows. So, we have no problems to sell that message.”* (Ghe).

Cities in early widespread acceptance deemphasize data for fear that gaps between data and perceptions of reality might undermine CBCA legitimacy. *“It’s scary for us to go out with a number saying: this is the emission reduction from like eating one kilogram less of meat. Because we cannot say that emission factor is correct, because we do not have the data.”* (Oslo) Acknowledging these difficulties and focusing on actions, shifts attention to pragmatic legitimacy. Will actors be open to reducing consumption emissions associated with municipal contracts (exchange legitimacy)? Does it seem plausible that addressing a given sector will serve the broader interests of the community (influence legitimacy)? However, legitimation through metrics cannot be avoided indefinitely.

As cities progress within internal and external widespread acceptance phases, metrics slowly regain importance. Not as predictive

tools, but as means to validate impacts. Refocusing on data and methodologies helps cities convert CBCA legitimacy from short-term to long-term. Through greater engagement with metrics, cities can showcase past successes, foster a sense of control over consumption-based emissions, and reinforce perceptions of trust through commitments to data quality and transparency. Hence, metrics contribute to procedural, structural and ultimately dispositional legitimacy. As resource allocations and social impacts of CBCA measures increase, so do demands by citizens and local politicians to demonstrate impacts. Yet, for most cities establishing a clear link between actions and emission reductions remains a challenge. *“Since we are lacking in numbers, it’s also difficult to show the improvements we are making or the effects of the measure. And that is a problem when it comes to the political view, they want to show results.”* (Oslo).

Pressure from politicians, a by-product of greater citizen scrutiny, is particularly strong with respect to CBCA measures that impact individual lifestyle choices. This pattern is reminiscent of Ashforth and Gibbs (1990) scrutiny-legitimacy vicious cycle where increased scrutiny reduces tolerance for deviations from best practices. Hence, methodological discrepancies, accounting boundaries, data quality, and timeliness become pressing problems to address. In response, cities like Stockholm collect their own data and have developed their own methods to measure the effects of their actions. However, data-based legitimation efforts must be carefully calibrated. As demonstrated by Sareen (2020), symbolic legitimation based on metrics may breed more skepticism than support if gaps are perceived between claims and reality or if legitimation efforts are deemed excessive.

Once CBCA becomes taken-for-granted, data and methodological limitations become issues that leading cities can help address. At this stage, metrics are tools used to compete for institutional authority (Sareen, 2020). Pointing out problems and areas for further improvement cements the legitimacy of leading cities like Paris and Stockholm. By proposing methodological improvements that align with local practices, leading cities stay one step ahead, further reinforcing their leadership status. This strategy also wards against a downfall of taken-for-granted legitimacy, the potential for actors to become irrelevant. According to Suchman (1995), when organizations or institutions become so embedded that alternatives become unthinkable, they risk being overlooked during decision-making. To avoid this situation, leading cities promote continued engagement with CBCA metrics. Paris, transnationally, and Stockholm, within Scandinavia, are protecting their relevance by championing for, and embedding themselves within, processes of continuous methodological improvement.

Our temporal approach to urban CBCA legitimation helps nuance several academic findings with respect to metrics. Many scholars indicate that limited data availability, poor data quality (Millward-Hopkins et al., 2017), methodological discrepancies (Mirabella and Allacker, 2021), and limited metric transparency (Balouktsi, 2020) challenges CBCA legitimacy. We find that data and methodological issues affect perceptions of urban CBCA legitimacy differently depending on the maturity of municipal engagement in CBCA legitimation. While we agree with Sareen (2020) that metrics can be used to resist change, justify incremental change, and be co-opted by institutions to reinforce their own legitimacy. However, we argue that different types of engagement with metrics, at different phases of legitimation, can support change.

From a practical perspective, our findings suggest that not all legitimacy challenges associated with metrics need to be tackled at once. On the contrary, engagement with metrics should reflect urban CBCA's legitimization phase. While methodological issues are associated with difficulties in gaining CBCA legitimacy initially, these challenges are quickly set aside once CBCA becomes comprehensible with respect to existing priorities and practices. Hence, our findings suggest that in early CBCA engagement municipal practitioners should focus on building CBCA comprehensibility beyond metrics. Not dwelling on data frees up precious resources to create discourses that can support locally relevant policy decisions. This approach avoids the risks associated with relying on metrics that are neither well defined nor understood. Prioritizing comprehensibility in CBCA decision-making also eliminates the problem raised by [Ottelin et al. \(2019\)](#) of conflicting data-driven policy recommendations. Many scholars argue that urban CBCA legitimacy would be enhanced by more standardized approaches ([Chavez and Ramaswami, 2014](#); [Mirabella and Allacker, 2021](#)). While harmonization would enable comparisons between cities, these comparisons are a largely academic pursuit. We argue that urban climate action is better served by methodological consistency over time and coherence with local expectations, than by global CBCA practice standardization.

6 Conclusion

This study explored the legitimization of urban consumption-based carbon accounting (CBCA) in Europe. Based on interview data collected from municipal representatives in 17 European cities, we find that achieving political legitimacy for urban CBCA is based primarily on the construction of cognitive legitimacy. CBCA is made comprehensible top-down, through support from higher levels of government, or bottom-up, by associating CBCA practices with achieving other urban objectives. While complexities associated with data collection and analysis are initially used to justify inaction, once CBCA is made comprehensible, these concerns take a back seat to action. These findings, based on a sociological approach to legitimacy and legitimization addresses two significant gaps in the literature, which predominantly focuses on the technical aspects of CBCA (e.g., data availability, calculation methodologies) and its normative legitimacy. Shifting attention towards the political and governance dimensions of CBCA, opens the door to better explanations for CBCA's delayed adoption and provides insights into how to support its progressive implementation. This study reveals the importance of the construction of cognitive legitimacy as a key enabler to advance CBCA.

Another key contribution is the development of a temporal legitimization framework that helps position challenges to CBCA's legitimacy with respect to the maturity of municipal engagement with CBCA practices. We find that the role of metrics differs in each legitimization phase. Our findings suggest that not all challenges associated with metrics need to be tackled at once. Rather, engagement with metrics should reflect urban CBCA's legitimization phase. The framework developed here provides municipal practitioners with a tool to help assess urban engagement in CBCA legitimization, identify potential pitfalls, and develop promising legitimization strategies.

In spite of these insights, this research is not without its limitations. This study has focused on European cities, with the research sample

being disproportionately weighted toward Northern European cities, especially Nordic cities. This reflects early engagement with CBCA in these cities. Broader comparative research is needed to validate the applicability of these findings to a more diverse set of cases, especially those beyond the European context. This paper has also discussed legitimacy through a series of interviews which make up a snapshot of contemporary legitimization barriers to CBCA. While this serves as a means of commencing research to this field, follow-up interviews would afford insights into how the legitimization process evolves over time. By studying cities that are relatively advanced in their approach to CBCA, the analysis of legitimization processes is limited to more proactive municipalities, thereby introducing a degree of bias. Future research should expand to include less advanced cities to gain a more nuanced understanding of how CBCA is delegitimized by cities that are less inclined to adopt CBCA. Finally, this paper has focused primarily on how to gain political legitimacy. As engagement with CBCA increases, future work could investigate how cities maintain or repair CBCA legitimacy, in particular through participation in ongoing CBCA policy development.

Based on our reflection on these limitations, we propose the following future research directions:

- 1 Research with more diverse participants: Our sample was limited to European cities, where the role of EU policies is very important to shape climate governance. Including cities from other regions with weaker institutional support for climate action would help test the generalizability of CBCA legitimization dynamics. Furthermore, engaging stakeholders from organizations that work with cities (EU institutions, municipal networks, consultancies) could shed light on the role of a wide range of actors in the legitimization process.
- 2 Longitudinal research: Studying CBCA legitimization over time would provide a valuable complement to the present study which provides a snapshot of municipal engagement with CBCA. Our temporal legitimization framework would benefit from empirical testing across multiple points in time. Longitudinal studies could capture shifts in cognitive, normative, and pragmatic legitimacy as cities progress (or not) in the implementation of CBCA and may reveal how external shocks – especially policy changes at national or EU level – accelerate or hinder CBCA's institutionalization.
- 3 Inter-organizational implication of CBCA adoption: CBCA measures at the urban level could have cascading effects for many public and private actors, particularly through Scope 3 related policies that address procurement, waste management, and supply chain governance. Comparative studies could investigate how different organizational contexts (NGO, businesses) view CBCA's legitimacy and the role of metrics. Such studies focusing on cities where CBCA enjoys a high level of institutional legitimacy could provide a deeper understanding of how CBCA becomes politically legitimate across urban sectors and systems.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

Ethical approval was not required for the studies involving humans because not required by the institution. The studies were conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study. Written informed consent was obtained from the individual(s) for the publication of any potentially identifiable images or data included in this article.

Author contributions

LH: Conceptualization, Data analysis, Project administration, Writing – original draft, Writing – review & editing. ED: Investigation, Formal analysis, Conceptualization, Writing – review & editing. Writing – original draft, Data curation, Methodology. WB: Data curation, Formal analysis, Writing – original draft, Conceptualization, Investigation, Writing – review & editing, Methodology.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Supplementary material

The Supplementary material for this article can be found online at: <https://www.frontiersin.org/articles/10.3389/frsc.2025.1667409/full#supplementary-material>

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