

The Urban Dimension of Climate Policies: Shaping the Policy Content of Adaptation and Mitigation Strategies in Cities

ABSTRACT

Despite recent focus on urban climate policies, it remains insufficiently clear how the two cross-sectoral domains of climate change are locally framed, mainstreamed and subsequently governed. To what extent are climate issues integrated in urban policy fields, such as energy and transport and why is this typically less so the case in others, such as urban planning, health or consumer issues – even though measures in the latter might lead to more cost-efficient results for resilience and/or higher emission cuts? To better understand the shaping of policy content this paper explores how climate mitigation and adaptation strategies have evolved in two cities in the USA and in Germany – using Boston and Berlin as case studies. Both cities set themselves ambitious goals and have been active in climate actions for more than a decade, while the extent of mainstreaming in various urban policy fields has changed over time. Adopting a qualitative, comparative case-study design, differences as well as similarities between the US and German cities are made explicit. The study draws on local expert interviews (N=44), document analysis and on participatory observation. Results of the case-studies indicate that the content of urban climate policies is a product of path-dependent discourses and deliberations between local policy-makers, various urban departments, interest groups, academics and consultants. Especially in Germany, urban strategies are also strongly influenced by European and national regulations, whereas the city and the state level play a much stronger role in the US due to volatile climate efforts on the federal level. In both cases, further mainstreaming of climate issues on multiple levels is strongly needed to achieve the urban climate goals.

1. Introduction (address a significant problem or puzzle)

Climate action in cities has received a lot of attention against the background of often stalled international climate negotiations in the past. Concerning climate mitigation, cities are referred to as being part of the problem because of higher emissions as well as part of the solution due to their potential to drive low-carbon innovations. Moreover, many urban agglomerations are highly vulnerable to climate-induced weather events, such as the heat island effect, storms or floodings, leading to increased relevance of climate adaptation.

Increasing role of cities in transnational networks

The mixture of high responsibility, high vulnerability and inadequate actions taken at the national and global level has made city leaders and city networks more vocal about their role in climate change. This is visible in international climate negotiations such as the COP as well as in scientific realm such as the IPCC. After the 2015 United National Climate Change Conference observers commented that “city mayors take on a starring role in Paris climate talks” (Vidal 2015) and indeed the Paris Agreement highlights the important role of the subnational and local level in the global response to climate change (UNFCCC 2015). In Paris, mayors of leading cities showcased their ambitious climate goals which commonly exceed those of their nation states. Two years later, at the COP23/CMP13 in Bonn the Global

Covenant of Mayors reports that nearly 7,500 pledged reductions of member cities (representing roughly 10% of the global population) have the potential to achieve a cumulated 46 Gt CO₂e emissions by 2050 – reaching a global average for 2.19 tons per capita (Global Covenant of Mayors 12.11.2017).

In many regions, however, climate action is not a new topic to decision-makers in municipalities: many cities in Europe and North America started already in the late 1980s to engage in sustainable local actions supported by growing transnational networks such as Local Governments for Sustainability (ICLEI), Energy Cities or the Climate Alliance. More recently, larger metropolises began to share experiences among the C40 Cities network and the European Covenant of Mayors as well as the US Covenant of Mayors for Climate and Energy (the latter two joining forces in 2016 in the mentioned Global Covenant). The Carbon Neutral Cities Alliance (CNCA) founded by 17 leading cities within the realm of the Urban Sustainability Directors Network (USDN) in 2016 is another recent addition to the bundle of urban platforms. The CNCA targets especially ambitious cities aiming for “deep reductions, which typically require transformative rather than incremental approaches” and self-represents a “new wave” of carbon neutral cities aiming for at least 80-100% GHG reduction by 2050 (CNCA 2016).

Cities and climate change: an emerging research topic in climate science

Traditionally, in global climate science as represented by the Intergovernmental Panel on Climate Change (IPCC), cities have not been among the key topics. Arguably, this is slowly beginning to change. While the IPCC in 2014 stated that “there has been little systematic assessment regarding the overall extent to which cities are implementing mitigation policies and emission reduction targets are being achieved, or emissions reduced” (Seto und Dhakal 2014), efforts are underway to close this research gap. An interdisciplinary crowd of researchers is starting to institutionalize global research efforts on cities and climate change. For instance, in spring 2018 the first Cities and Climate Change Science Conference, co-sponsored by the IPCC, was held in Edmonton, Canada and was “seen as a pivotal milestone in developing the global understanding of how climate change will impact cities and the role of cities in tackling climate change” (Jones 2018). Additionally, the IPCC has announced to issue a Special Report on Climate and Cities in its 7th Assessment Report Cycle (AR 2023-2028). This report is envisaged to be linked and strongly informed by the Third Assessment Report on Cities and Climate Change (ARCCC3.3) – a product of the Urban Climate Change Research Network (UCCRN) based at the Columbia University in New York. In its 11th year the UCCRN has gathered and organized urban researchers around the world in regional hubs, produced two assessments reports to fill some of the urban research knowledge gaps and developed a Case Study Docking Station for researchers, practitioners, and policy-makers alike. Based on this previous research, key researchers of the UCCRN recommend a rather inclusive, holistic and practical approach for future urban research. For instance, an “urban systems approach, including sector interdependencies, technology, and governance” as well as “considering adaptation and mitigation in an intertwined way” are considered key for future assessments (Solecki et al. 2018). While international research efforts on the topic increase,

implementation of climate measures are up to cities and towns. These in turn are strongly dependent upon their respective national and regional political-institutional and cultural frameworks. Hence it remains an open question how well international research propositions can be translated to local researchers and decision-makers and vice versa.

Performance of cities in urban climate strategies

Despite the flurry of municipal action on mitigation and adaptation and the connected hope that cities will be key for global sustainability, many scholars have expressed concern not to overestimate the potential of cities in tackling climate change (van der Heijden 2018; Fuhr et al. 2018). A couple of reasons justify caution:

First, actual performance in terms of outcomes is difficult to measure in cities or in other words: there is potentially a gap “between the rhetoric and reality of urban responses” (Bulkeley 2010, 231). One reason is that progress is simply difficult to measure: Even, though a more or less robust greenhouse gas inventory is set up, longitudinal and comparable evaluation studies to actually assess urban climate strategies are scarce (see an early exception Sippel 2010). Comparing actual mitigation outcomes in cities is challenged by methodological differences in the way many inventories are set up. Above mentioned transnational networks such as ICLEI and C40 and the emerging regional focus of the IPCC has pushed efforts to harmonize the accounting local climate action plans – one result is the creation of the Global Protocol for community-Scale Greenhouse Gas Emission Inventory (CoM 2016). However, systematization and mainstreaming of different approaches take time and practical problems in terms for widespread implementation remain a challenge (Yetano Roche et al. 2014). All this makes comparable evaluation studies of actual policy *outcomes* for urban climate change complicated and leads to a focus of policy *output*, i.e. plans and strategies of municipalities (Heidrich et al. 2015; Reckien et al. 2015).

Other reasons relate to political, socio-economical and institutional barriers: Cities have limited power to control direct or indirect emission sources which are not based on municipal authority such as municipal buildings or lightning systems. For the bulk of urban emissions cities rely on mutual efforts by other municipal actors, such as local businesses, building owners, regional utilities and – in general - their citizens. Even within municipal administration the integration of climate issues across different units is challenging: the main responsibility of climate strategies often lies with the environmental department, but the lacking political will impedes implementation of policies in other relevant departments (Barnebeck und Kalff 2015). In a number of qualitative studies, city officials document the difficulties to achieve set climate and sustainability targets making their accumulated reduction efforts seem much less optimistic (e.g. Garzillo und Ulrich 2015).

Second, most research concentrates on leading cities. however, in the majority of cities and towns climate change “remains un-governed” (van der Heijden 2018). Urban networks may differ regionally and sometimes thematically. But most of them share the goal of serving as a knowledge dissemination platform among their member cities internally as well as a lobbying force representing interests of municipalities at the regional, national or global level (Kern & Bulkeley 2009). While some results indicate that these networks provide assistance to overcome national and regional barriers to implement climate strategies, most of them attract

“well-performing cities rather than poorperforming ones and provide an unrepresentatively high willingness of cities to take climate action” (van der Hejden 2018).

Third, the complexity of normative integrative measures is highly challenging for local administrations. While most studies view an integrated and holistic approach most appropriate, spanning not only mitigation and adaptation-related climate measures but rather embedding urban strategies in a larger sustainability framework (Burch 2010), practical implementation is limited. Achieving results, i.e. reducing emissions effectively or increasing resilience, is often hindered by administrative silos as well as diverging priorities among key stakeholders and different levels of policy-making. One line of research focused on the difficulties to overcome the adaptation-mitigation dichotomy (Biesbroek et al. 2009). There are still differences between the adoption of local strategic plans concerning mitigation and adaptation (Reckien et al 2014) in a way that mitigation plans clearly dominate adaptation plans in absolute number. This dichotomy and unequal dispersion still prevails even though city-networks such as the EU Covenant of Mayors try to combine the two domains as visible in the recently introduced “Sustainable Energy and Climate Action Plans” (SECAP) which now covers both mitigation and adaptation measures (Climate Alliance 2016). Some researchers believe that one reason for this difference is “due to the use of central government-led policy support schemes aimed at vertical policy integration of climate change mitigation policies” – in contrast to adaptation goals which are not (as) easily dispersed vertically (Hoppe, et al 2014). While this clearly reflects the diversity and complexity of local policies – not only vertically, but also horizontally, it also denotes a content-related broadness of what is being framed as local climate strategy. In other words, which kind of policy issues to be covered in municipalities is highly diverse and depends on varying multi-level arrangements, local conditions and path-dependent developments in different settings.

2. Research Question

The *policy content*, the inter-relations between urban mitigation and adaptation strategies, is at the core of this research. The links between these two strategies can, however, not be studied, without looking at the overall policy process of either mitigation, adaptation or more broadly sustainability. This is because both urban climate policy-arenas are inherently cross-sectoral and cross-scalar and often embedded within or – preceded by - a broader sustainability discourse. In other words, the level of integration is determined by the previous understanding and handling of each strategy within a particular city or region. As mentioned above, the inherent logic of adaptation and mitigation approaches can be quite different, because of different intellectual roots, different temporal and scalar levels and different actors and sectors involved (*strong link to policy processes*). The issue of integrating mitigation and adaptation can be also considered as a dual challenge. This is because both climate change strategies are comparatively new to the urban agenda and neither urban mitigation or urban

adaptation can be considered to be 'fully institutionalized'¹ yet. Hence, there is the need to study the question of which policy elements are being integrated and – maybe more importantly – in which sectors or institutions the integration takes place (or not) (Baker et al. 2012; Berry et al. 2014; Wejs 2014). In the case of climate change this is particularly complex, because neither mitigation nor adaptation fall into one single sector. Rather a number of different sectors such as energy, water, transport are involved and interlinked. It is therefore necessary to carefully describe the involved sectors and to deduct potential synergies and conflicts between and within the urban strategies of mitigation and adaptation.

Despite recent focus on urban climate policies, it remains insufficiently clear how the two cross-sectoral domains of climate change are locally framed, mainstreamed and subsequently governed. To what extent are climate issues integrated in urban policy fields, such as energy and transport and why is this typically less so the case in others, such as urban planning, health or consumer issues – even though measures in the latter might lead to more cost-efficient results for resilience and/or higher emission cuts?

To shed light on the how (climate) policy content as a deeply cross-sectoral issue is being shaped in cities, I pose two main research questions:

1. What is the origin and content of overarching climate policy strategies in cities?
2. What are the differences (and potential synergies and trade-offs) between the two domains of mitigation and adaptation?

The analysis of the *policy content* is one part of a larger research framework which covers equally the *policy process* and *policy scale* of urban climate strategies.

The research design is exploratory in the way that it studies the complexity of urban climate policy-making and thereby contributes to the understanding of which factors hinder or drive policy-processes for climate strategies. It therefore falls into the category of hypothesis-generating research and aims to better understand and define future research fields in the area of metropolitan climate governance.

3. Methodology and research design

To better understand the shaping of policy content this paper explores how climate mitigation and adaptation strategies have evolved in two cities in the USA and in Germany – using Boston and Berlin as case studies. Both cities set themselves ambitious goals and have been active in climate actions for more than a decade, while the extent of mainstreaming in various urban policy fields has changed over time. Also, both cities are not only members of the C40 network, but have joint forces with another recent city networks/ projects aiming at becoming climate neutral (see above) and therefore belong to one of the pioneering global cities (CNCA 2016).

¹ Compared to other urban policy arenas such as land-use planning, education or sport, mitigation and adaptation policies are often not only framed differently, but sometimes, especially in US cities, lack an institutional home, such as a specialized urban unit working on climate change or responsible urban officers (e.g. Wood et al. 2013).

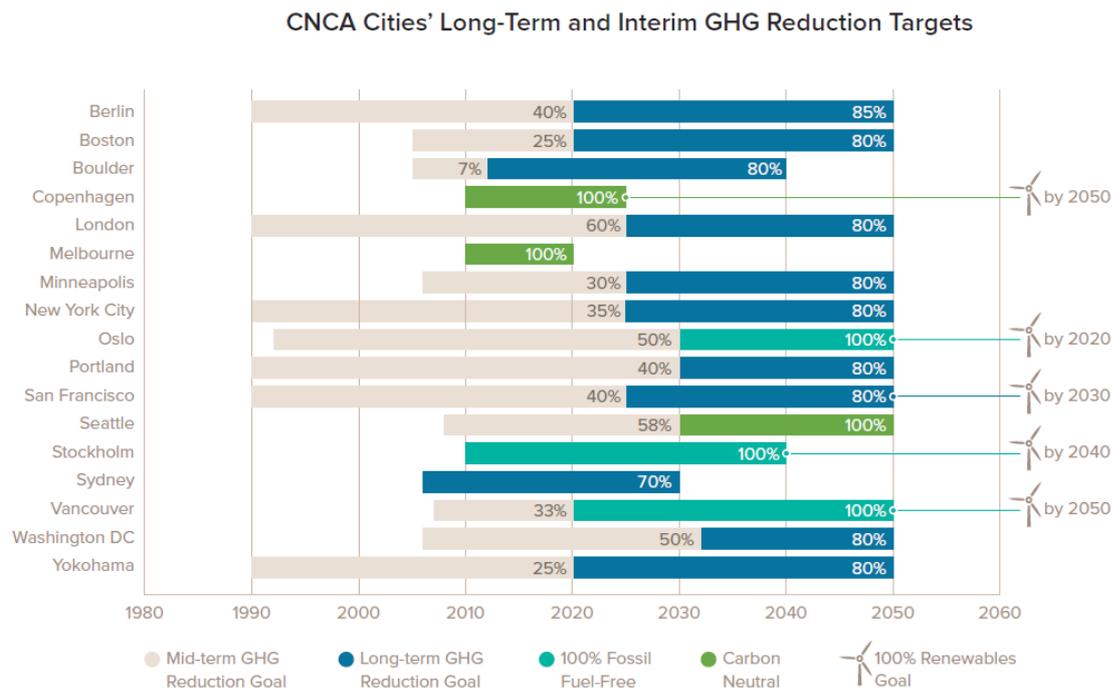


Figure 1: Comparison of climate mitigation goals (CNCA 2016, 3)

The comparison of CNCA cities shows that Berlin and Boston are ambitious, but not as ambitious as frontrunners such as Copenhagen and Seattle. For the purpose of analysis both are suitable cases, as they have not only developed mitigation plans, but also adaptation plans

For this study, I adopted a qualitative, comparative case-study design, differences as well as similarities between the US and German cities are made explicit. The study draws on local expert interviews (N=44), document analysis and on participatory observation. Results of the case-studies indicate that the content of urban climate policies is a product of path-dependent discourses and deliberations between local policy-makers, various urban departments, interest groups, academics and consultants. Especially in Germany, urban strategies are also strongly influenced by European and national regulations, whereas the city and the state level play a much stronger role in the US due to volatile climate efforts on the federal level.

To analyze the policy content of climate strategies I focus on written material of the two cities, i.e. mainly the adopted, current climate action plans as well as supplementary material. Where the document analysis met its limits I consulted my transcribed interview material to provide relevant background. The analytical framework, which is presented next, served as my research frame to study and compare the policy content of the two cities.

4. Analytical framework

Despite the differences of policies in various sectors, most public policies are made up of basic elements which can be analyzed and compared. These are usually goals, instruments, actors or agents and target groups (Howlett 2011). In other words – and to paraphrase one of

the classical protagonists of modern policy-analysis Thomas Dye (1976)²: the study of policy content answers the question of `who (agents) does what (instruments) with whom (target groups) to what end (goals)`?

Generally, *goals* describe qualitatively and/or quantitatively what a policy aims to achieve. This may include broad normative statements which are usually not only confined to either mitigation or adaptation policy but to other, neighboring policy objectives such as equity, security and sustainability. Sometimes these goals also include very precise and operationalized description of what a policy is desired to achieve (Kramers et al. 2013). Depending on the issue, goals are usually found in policy documents, coalition agreements or proclamations along with a problem statement which is to be solved. In some cases though, goals, especially when it comes to more specific policy issue areas, need to be inferred from interviews with policy-makers (Vogel und Henstra 2015). One of the challenges of goal setting is about finding a balance between different time horizons and issue areas. For example, long-term climate mitigation goals may hinder goal achievement in economic sectors. Some cities have however shown that seemingly incompatible goals of long-term sustainability and short-term economic revenues can be combined. While this may not be feasible in every case, it is important to consider possibly conflicting goals, especially in mitigation and adaptation urban planning (Fünfgeld und McEvoy 2011). To compare the goals in the respective issue areas I will focus hence on the detail and specificities of goal setting in mitigation and adaptation, the broadness of policy goals, the source of goals and indicators of goals (see Table 1).

Table 1: Criteria and key questions on goals for urban mitigation and adaptation (Source: author)

Criteria for goals and objectives	Key questions concerning urban mitigation and adaptation
Type and scope of goal setting	<ul style="list-style-type: none"> - Are goals specified for certain sectors, policy-fields (e.g. energy, water etc.) or more broadly for overarching policy goals (sustainability, safety etc.)? - Are possible goal conflicts made specific?
Usage of goal indicators	<ul style="list-style-type: none"> - Are identifiable indicators used for goal attainment? - Are there quantitative or qualitative goals? - Are there indicators for policy integration of mitigation and adaptation?
Origins of goals	<ul style="list-style-type: none"> - Are goals specific for the city or were they induced through other levels of hierarchy or city networks?

² Dye (building on other important theorists such as Harold Lasswell) defined public policy as what governments do (or don't do) in respect to the policy goals and policy means and what difference it makes. Importantly, the notion of governments has changed to a more broader understanding of political actors (or in this case agents) which include – next to governments and governmental agencies – also individuals such as politicians, directors of associations, journalists or scientists among other or institutions such as local parliaments, foundations, housing cooperatives and others (Schubert und Bandelow 2015).

Policy instruments are the tools and techniques which are used by governments to achieve the above mentioned goals. They are at the heart of the various stages of the policy processes and they “...affect both the agenda-setting and policy formulation processes as well as being the subject of decision-making policy implementation, and evaluation” (Howlett 2011). In public policy a wide range of typologies and categorization of instruments exist. Some of them classify instruments along their degree of regulative power or the level of coerciveness (Braun und Giraud 2015; Shroff et al. 2012; Hall 1986). Policy instruments for urban mitigation and adaptation can take on many different forms, ranging from “soft” (e.g. voluntary, informatory) to “hard” (regulatory) measures (Zehavi 2012; Howlett 2011; Howlett et al. 2009).

The selection of particular types of instruments is in practice – to the dismay of many – usually not guided by their expected effectiveness (which of course is a recurrent issue in political science). Rather, choosing specific policy instruments is the result of a complex struggle of policy-making, balancing views of different actors, norms and values while being embedded in a path-dependent and resource-constraint environment (e.g. Linder und Peters 1990) – or in the words of a now-classic: muddling through (Lindblom 1959).

In the case of mitigation and adaptation policies in cities it is also important to describe relevant sectoral policies and to clarify which instruments can be “counted” as urban climate change policies as this is by no means trivial. Dupuis und Biesbroek (2013) have shown in a meta-analysis that there are very different understandings among scholars when identifying actual climate change policies (and hence instruments). Massey and Bergsma (2008) have identified 28 adaptation measures in the UK and 10 measures in the Netherlands, while Tompkins et al. (2010) named 300 measures in the UK and De Bruin et al. (2009) identified 96 in the Netherlands.

In order to better understand these specific inter-relations on the local level, relevant instruments are analyzed in terms of their type along a voluntary-compulsory axis (e.g. voluntary, informatory, financial incentives, market-based, regulatory³), in terms of their sectoral fit and in terms of their origin (regional, national or urban level).

Table 2: Criteria and key questions on policy instruments for urban mitigation and adaptation (Source: author)

Criteria for policy instruments	Key questions concerning urban mitigation and adaptation
Type and number of instruments	- What type of instruments (voluntary, informatory, financial incentives, market-based, regulatory) are deployed to achieve urban mitigation and adaptation goals?

³ Linder und Peters 1990) proposed a descriptive sample of instruments in which they structured instruments in seven classes with each 3 or 4 instruments: direct provision (public investment, gov` t provision, gov` t sponsored enterprise); regulation (quota, quality standard, price control prohibition); authority (certification/screening, license/permit, procedural guideline), subsidy (cash grant, in-kind transfer, loan guarantee, loan), tax (tax break, fee/charge, fine), contract (administered contract, franchise, insurance) and exhortation (jawboning, public promotion, information/demonstration).

	<ul style="list-style-type: none"> - How many instruments are deployed for urban mitigation and adaptation?
Scope of instruments	<ul style="list-style-type: none"> - Which sectors are (mostly) affected by mitigation and adaptation instruments? - What are differences between mitigation and adaptation policies and where do they interact?
Origins of instruments	<ul style="list-style-type: none"> - What are the origins of urban mitigation and adaptation instruments (EU-level, national level, regional, urban)?

5 Case-Study Background

5.1 Background: Climate Action Plans in Boston

Climate action in Boston can be traced back to the late 1990/ early 2000s when the city joined – shortly after neighbouring Cambridge – the city network ICLEI.

The authoritative starting point for climate action in Boston is the executive order by then-Mayor Thomas M. Menino on climate change in 2007. The short 4 pager is frequently referred to by interviewees and subsequent policy papers. While it is the origin of several subsequent climate plans, it also holds a number of key points which mirror the self-perception as well as ambitions of the City of Boston.

For example, the executive order starts off by stating Boston “has been a leader in recognizing the threat of climate change by signing the U.S. Mayors Climate Protection Agreement and joining ICLEI’s Cities for Climate Protection Campaign”. In the context of other U.S. municipalities the wording is noteworthy in two ways: firstly, simply “*recognizing* the threat of climate change” is considered as a leadership worthy action. This reflects the contentious U.S. climate policies, especially during the era of the Bush administration from 2000-2008, which – very generally put – tried to depreciate the impacts of climate change (Selin und VanDeveer 2009; Rabe 2010). Secondly, using the term “*recognizing*” is not the same as, for instance, “*addressing*” which would imply a more energetic leadership role. Even though the executive order lists several measures, such as energy efficiency, green building standards, employment of renewable energy sources, the city staff responsible for drafting the executive order were aware that the Boston – unlike other US cities – were in 2007 not (yet) leading responses to climate change impacts (Interviewee NGO).

Interestingly, the perceived threat is explicitly specified in the executive order as it states that “climate change poses risks to Boston residents, visitors, business, institutions and infrastructure, including risks associated with heat waves, changing disease patterns, sea-level rise, changing precipitation patterns, increased severity of storms and flooding, and stress on water and energy systems” (City of Boston August 2007, p. 2).

Year	Policy documents/Membership assignment	Key Content	Authoritative status
2000	Joining ICLEI – Cities for Climate Protection Campaign	Committing to 5-Step process of ICLEI (see chapter xx) - no concrete	Voluntary action
2000	Signing US-Mayors Climate Protection Agreement (MCPA)	Declaration to meet or exceed U.S. emission reduction goal of the Kyoto Protocol (- 7% by 2012 below 1990 levels)	Voluntary action
2007	Executive Order	- Same goal for 2012 (-7%) pursuant to US-MCPA goal - additional long-term goal 80% by 2050 - no mid-term goal - several specific subgoals for mitigation and adaptation - order of establishment of Mayors Community Climate Action Task Force	Binding municipal order of mayor
2011	A Climate of Progress	First Comprehensive Urban Climate Action plan, including both mitigation and adaptation	Planning document
2014	Update Greenovate Boston Climate Action Plan	35 strategies and 98 actions, living document – accompanied by website monitoring progress and managei	Planning document

Source: City of Boston (2016) <http://www.cityofboston.gov/climate/progress/history.asp>

In 2014, Boston's Climate Action plan of 2011 "A Climate of Progress" was updated in a comprehensive and participatory process. Under the auspices of a newly developed mayor-led initiative "Greenovate" the 2014 plan reaffirmed long-standing goals to reduce community GHG emissions by 25 percent by 2020 and 80 percent by 2050. It also introduced and hence strengthened the adaptation part of climate governance by mentioning a number of measures to prepare for climate impacts such as rising sea levels and more frequent temperature extremes and precipitation events. To define "climate preparedness, the city of Boston also notes that "preparedness applies to the social and economic environment, how and when businesses operate, how well neighbors know each other, and what resources are available to help those in need." (City of Boston 2014a, 10)

5.2 Background: Climate Action Plans in Berlin

Climate change policies in Berlin have been mostly associated with an energy efficiency perspective and have been influenced by various historical and political discourses. The focus of the policy content is on the latest policy strategy in Berlin, namely the Berlin Energy Transition Law. Surrounding the development of this law are a number of parallel processes which were mostly led by the “Special office of Energy and Climate” in the Senate’s Branch of Environmental Affairs. The law is closely tied to Berlin’s Energy and Climate Program (Hirschl et al. 2015), which serves as the main basis of the subsequent policy content analysis. The content analysis of the climate policy goals, its instruments and agents reveals a multi-layered approach of urban climate policies and great differences when it comes to sub-sectors within the climate framework legislation. Policy fields such as energy supply, for instance, are mostly dominated by few economically powerful actors, whereas others such as urban planning and consumption issues are more broadly spread across different policy-making levels, agent and actors. The inherently diverse character of climate policy measures increases the challenges of tracking the implementation and evaluating progress.

The latest climate-related goal of the city-state Berlin was published as part of the coalition agreement in 2012 between the social-democratic party (SPD) and the christian democrats (CDU) and called for a “climate neutrality goal” by 2050. To fill this political goal with content and specific mid-term targets, the Senate of Berlin pursued a dual strategy. On the one hand it commissioned several reports and feasibility studies to analyze whether a climate neutrality goal is feasible or not. On the other hand, the Department of City Planning and Environment (SenStadtUm⁴) prepared a legal process which aimed to pass an updated law on climate issues which would replace the former Berlin Energy Saving Law from 1992.

The Senate of Berlin, its executive branch, has passed the “Berlin Energy Transition Law” (Energiewendegesetz EWG BLN) in spring 2016 which also includes a paragraph on climate adaptation. In §10 it reads that the Senate of Berlin is responsible for (...) to develop strategies and measures which aim to improve the resilience of natural, social and economic systems and which will sustain the functions of urban infrastructure and quality of live.⁵” (Senate of Berlin 2016)

Year	Policy documents/Membership assignment	Key Content	Authoritative status
2006	Berlin Energy Programme 2006-2010	Berlin committed itself to a 25% reduction of CO2 emissions by 2010 compared to 1990.	Voluntary action
2008	Berlin’s Energy Plan 2020	A catalogue of measures and actions, in a short-term (until	Voluntary action

⁴ In late 2016 the coalition between the Social Democrats and Christian Democrats in Berlin’s State Parliament (Berliner Abgeordnetenhaus) came to an end when a new left-winged/green coalition was formed by the Social Democrats, the Party “Die Linke” and the party “Bündnis 90/Die Grünen”. With the

⁵ Translation by author.

		2013) and in a long-term perspective (until 2020) have been identified and approved in April 2011. This Plan serves as a guideline for a sustainable, energy efficient and renewable energy policy in order to reach the target of a 40 % CO2 reduction by 2020 and even takes into account the target of a 80% CO2 reduction by 2050.	
2016	Berlin Energy Transition Law	Berlin`s House of Representatives adopts first Berlin Energy Transition Law, replacing earlier legislation. Goal: climate neutrality by 2050 and phasing out of coal by 2030	City State Law
2018	Berlin Energy and Climate Plan	Berlin`s House of Representatives adopts corresponding measures from the Berlin Energy and Climate Plan (2017-2021); includes mitigation and adaptation measures and comprehensive monitoring	City State Law

6 Comparison of Policy Content of Climate Action Plans in Berlin and Boston

Will be included in update/presentation

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