Local climate governance in action The challenges to contributing to national mitigation targets in the case of Santiago de Chile

by Jose Selles ortiz

Submission date: 30-Aug-2019 12:50PM (UTC+0100)

Submission ID: 110382343

File name: 64955_Jose_Selles_ortiz_Local_climate_governance_in_action_The_challenges_to_contributing_to_national_mitigation_targets_in_t_1165912337.pdf (3.55M)

Word count: 18253

Character count: 105769

University College London
Faculty of The Built Environment
Bartlett School of Planning

Local climate governance in action: The challenges to contributing to national mitigation targets in the case of Santiago de Chile

José Ignacio Selles Ortiz

Being a dissertation submitted to the faculty of The Built Environment as part of the requirements for the award of the MSc Sustainable Urbanism at University College London:
I declare that this dissertation is entirely my own work and that ideas, data and images, as well as direct quotations, drawn from elsewhere are identified and referenced.

Signature:

Date: 30th August 2019

Word count
Main body: 10,944
Appendices: 4,991

Acknowledgements

I would like to thank Dr Catalina Turcu for supervising me during the dissertation process. I couldn't have produced this research without her guidance. I wish to acknowledge Patricio Espinoza for his valuable guidance during the process.

I would like to thank the 51 municipal teams who took the time to complete my questionnaire and provide the supporting documentation. I would particularly like to thank those municipal officers and policymakers who agreed to be interviewed, for their time and willingness to share their experiences.

Finally, I express all my gratitude to Catalina, León and Pelayo, for their patience and encouragement during the process.

This work was funded by the CONICYT PFCHA / Magíster en el extranjero Becas Chile - Convocatoria 2017 – 73180550.

Table of Contents

List of figures

List of tables

Table of abbreviations and acronyms

CAP	Climate Action Plan
COP	Conference of the Parties
CORECC	Regional Climate change Committee
GCoM	The Global Covenant of Mayors for Climate & Energy
GHG	Greenhouse gas
GORE	Regional Metropolitan Government
ICLEI	Local Governments for Sustainability
INDC	Indented Nationally Determined Contribution
INE	National Statistics Institute
MLG	Multi-level Governance
NDC	Nationally Determined Contributions
OECD	Organisation for Economic and Co-operation Development
PNACC II	National Climate change Adaptation Plan 2017-2022
REDMUNICC	Chilean Network of Municipalities for Climate Action.

Abstract

Local climate action has been placed in the centre of the climate change mitigation strategies globally and, thus, the need to understand it is increasing. Consequently, there has been a growing literature examining the capacity of local climate action to effectively contributing to reducing Greenhouse gas emissions committed by national governments to the international climate regime, especially in Western countries. However, little attention has been placed in the Global South context. This dissertation aims to examine the local climate action in a southern context, to determine how mitigation measures undertaken by local governments in the Santiago Metropolitan Region contribute to Chilean commitments.

Based on governance literature, specifically a Multi-level governance framework, the study provides a comprehensive overview of the local climate action in the region. Employing mainly primary data and a mix of quantitative and qualitative, the dissertation analyses the case study and review the main challenges of local climate action in the country. Analysis of the data demonstrated that Chilean local climate action needs to strengthen its capacities to effectively contributing to the mitigation targets committed. The results suggest that local action faces several challenges that need to be overcome, grouped in four areas: resources, equity, measurements and strategic planning. Further research is required to examine technical aspects of mitigation measures and the application of indicators, as well as incorporate the rest of the municipalities of the country.

I. Introduction

Chile is organising the 25th session of the Conference of the Parties (COP25) to the United Nations Framework Convention on Climate Change (UNFCCC), taking place in December 2019 (UNFCCC, 2019). The main objective of this conference is to update the Nationally Determined Contribution (NDC) before 2020, towards limiting global warming to 1.5 ºC above pre-industrial levels before it has more irreversible impacts (IPCC, 2018). This conference gives Chile high visibility in the international agenda and drives the country to raise its ambitions towards decarbonised development (Fundación Terram, 2019). Indeed, the national government understands this as a historic milestone; the Minister of Environment has claimed that the meeting will be a perfect opportunity 'to show to the world what we are capable of' (https://mma.gob.cl/chile-es-el-proximo-organizador-de-la-conferencia-sobre-cambio-climatico-mas-importante-del-mundo/).

The Chilean Intended Nationally Determined Contribution (INDC) presented to the UNFCCC in 2015, in terms of mitigation, is divided into two types of commitments: a greenhouse gas (GHG) emissions reduction of 30% by 2030 compared to the level reached in 2007 and a forestry goal, recovering 100,000 hectares of native forest and capturing GHGs (Ministerio de Medio Ambiente, 2015). Following this, the national government developed the National Climate Adaptation Plan 2017–2022 and six sectoral plans, created the operational structure and currently is developing the Climate Change Legal Framework. This framework will assign responsibilities and targets to subnational and local governments for GHG reduction, according to the commitments ratified (Harris et al., 2019).

This devolution of power from central to subnational and local governments is particularly crucial because, historically, Chile is a highly centralised country, where most of the decision-making power rests in the national government (Scarpaci & Irarrazaval, 1994). Nevertheless, despite the recent efforts to incorporate a multi-level approach, this is still one of the main challenges facing climate change policies (Arriagada et al., 2018). Meanwhile some 345 local governments (municipalities) are already performing climate change actions in their territories and are begin to look for more ambitious mitigation goals (REDMUNICC, 2019). In their 2018 declaration, the Chilean Network of Municipalities for Climate Action urged the government to increase the Nationally Determined Contribution (NDC) goals that will be discussed in the COP25, aiming to achieve a minimum reduction of 45% by 2030 and reach zero net emissions by 2050 (REDMUNICC, 2018).

Climate change governance at the local level has been widely studied in developed countries (Di Gregorio et al., 2019). Nevertheless, little attention has been placed on developing countries (Ibid). A

contextualised perspective on this matter is essential because climate governance will depend on political and administrative context, economic and social conditions, among other local elements (Meadowcroft, 2010). This dissertation aims to contribute to filling this gap in the literature, utilising a governance perspective applied mostly in Western countries in a South American context. Indeed, to the knowledge of the author, there are no previous studies focusing on local climate action in Chile. Earlier studies on climate change governance in the country concentrate on the structure and institutionality (Arriagada et al., 2018; Harris et al., 2019). Hence, there are no available studies where the local action is located at the centre of the analysis.

Thus, this dissertation aims to examine the local climate action in the Santiago Metropolitan Region (SMR) to understand its role complying with the national GHG reduction targets. The main question seeks to answer: *How do mitigation measures undertaken by local governments (municipalities) in the Santiago Metropolitan Region contribute to national commitments to the Paris Agreement?* To answer this research question, the study utilises a Multi-level Governance (MLG) approach firstly developed by Marks and Hooghe and applied by several authors to urban governance, providing a comprehensive overview of the local climate action in the region. Furthermore, this approach provides an understanding on how the local governments overcome barriers to implement climate policies, looking at the 'synergetic interaction between institutions, levels of government, civil society and the private sector' (Harris et al., 2019). Conceptually, mitigation measures refer to the implementation of policies or strategies aimed to reduce the net amount of GHG emissions to the atmosphere (Boswell et al., 2012).

This study is structured as follows. First is a literature review about local climate action and its governance, focusing on a MLG perspective. Second, the methodology is presented, employing a mix of quantitative and qualitative methods to analyse the case study of the SMR. Third, it examines the environmental governance of the different municipalities in the area of research and provides the necessary background to understand the case. Fourth, the findings and discussion section presents the results of the study and the analysis of the outcomes, discussing the key elements needed to answer the research question. Finally, the conclusion reviews the main challenges of local climate action in Chile and locates this study within the context of the MLG literature, highlighting possible further research on the topic and its limitations.

II. Local climate action and governance models

The role of local governments in addressing climate change has been widely recognised during the last 20 years, starting with the critical place given to the cities in the Local Agenda 21 implemented in the 1992 Rio Conference (Rydin, 2010). The core of the Local Agenda 21 was to incorporate local communities and a wide range of actors into climate policies (Ibid). This was followed by the Kyoto Protocol (1997), Montreal (2005), Copenhagen (2009) and the Paris Agreement (2015); these conferences increased international awareness about the relevant position of cities dealing with environmental issues and introduced the importance of international cooperation between them to face their challenges (Bulkeley & Betsill, 2003).

During the past 30 years, networks for sustainability have been proliferating and 'much of the literature on urban and local governance for sustainability has emphasised the potential for achieving sustainable development through such local networks and consequent action' (Rydin, 2010: 53). As a consequence, different city networks aiming to promote climate change policies at the local level have emerged, such as Climate Alliance (1990), ICLEI-Local Governments for Sustainability (1990), Cities for Climate Protection, (2001), C40-Cities Climate Leadership Group (2005), Global Covenant of Mayors for Climate and Energy (2008) and so on; this shows the influence and power of cities in the global response to climate change (Turcu, 2018). Additionally, it highlights the importance of networking to bolster their influence beyond local boundaries (Bulkeley, 2013).

In the same period, climate action at the local level has been growing and, thus, the need to understand these processes is increasing (Bulkeley & Castan Broto, 2012). There has been a growing importance of this field in a wide range of approaches beyond governance studies, from the urban dimension of climate change in technical papers (IPCC, 2014) to local climate planning guidance (Boswell et al., 2012). These studies emphasize the relevant place of cities in reducing GHG emissions and addressing climate change. Moreover, scholars like Turcu (2018) argue that cities are the locus of planning to tackle environmental challenges. Some explanations for this might be the large footprint of urban areas, the large-scale consumption of energy and production of waste, the know-how of local authorities to translate global rhetoric into local practice in developing small-scale projects to clarify its costs-benefits relation, their ability to enable the action of different stakeholders into public policies and, finally, the full range of faculties in the political jurisdiction, including land-use planning, energy consumption, waste management and transportation (Bulkeley & Betsill, 2003; Bulkeley & Castan Broto, 2012; Newmann et al., 2009).

There has been a number of studies arguing that the capacity of national governments to achieve reductions targets committed to in international agreements depends on the local climate action (Bulkeley, 2000; Betsill, 2001; Bulkeley & Betsill, 2003; Bulkeley & Betsill, 2013; Bulkeley, 2013, Johnson, 2018). Bulkeley (2013) shows that the understanding of the detailed contribution of GHG emissions by the different types of activities at the city level is useful information to understand how they might be reduced and guide local action.

However, counting with this specific information to measure the carbon reduction in all sector and territories is challenging, mainly due to the disaggregated data collection (Turcu, 2019). Moreover, the diversity of climate change agendas and the particular emphasis of each local climate action plan are a challenge for integrating the current local efforts into common indicators and measurement tools at regional and national scales. Since 'the ways in which municipalities might seek to develop and implement the sorts of policy approach articulated above are potentially never-ending' (Bulkeley, 2013: 118), measuring the contribution of each local mitigation strategy to national GHG reduction commitment is hard to accomplish.

Besides the interest local governments might have in the potential of climate action plans (CAP), another critique to its capacity to establish effective mitigation measures is that 'the translation of political commitments and policy rhetoric into substantial and programmatic municipal responses has been limited' (Bulkeley & Castan Broto, 2012: 361). Consequently, an emergence research gap is the relation between local government's powers to develop comprehensive climate action and their capacity to effectively establish policies, considering the institutional, political and technical constraints they face.

Indeed, it has been argued that the current environmental governance has been restructured by a transition 'from government to governance, where governing takes place as network governance in the context of links between various actors at various levels' (Turcu & Gillie, 2019: 8). In this new paradigm, the location of power is shared between the state with the private and voluntary sectors as well as with the community, shifting its exercise power from hierarchy to networks and partnerships (Bulkeley & Betsill, 2003; Kousky & Schneider, 2003; Bulkeley & Kern, 2006; Bulkeley & Betsill, 2013; Lee & Koski, 2015; Johnson, 2018; Di Gregorio et al., 2019). The above does not mean that national governments are weaker than before. Instead, this shift is seen as a strategy to reaffirm their authority in a changing world, incorporating new actors into the exercise of power in order to achieve the best possible results, using governmental technologies, such as indicators, to control local governments from a distance (Bulkeley & Betsill, 2003; Cini & Bourne, 2005; Rydin, 2007; Rydin, 2010; Turcu & Gillie, 2019). The global trends that frame this governance shift are: '1) devolution of power from central to local

governments; 2) increased sharing of power between the state and civil society, and; 3) reduction of state sovereignty through joining of international coordination mechanisms' (Di Gregorio et al., 2018: 65). Rydin, in her study about local sustainability indicators, argues that 'the trick within governmentality is that the creation of autonomy actually enables the goal of [national] government to be achieved' (2007: 611).

Following the above, other authors argue that climate change is such a complex phenomenon that it cannot be addressed at any particular scale, highlighting the influences between different levels of power and institutions to achieve effective results (Boswell et al., 2012; Lee & Koski, 2015; Di Gregorio et al., 2019). In this sense, Bulkeley and Betsill (2005) argue that the governance of climate change involves the cooperation between different levels of government (national, regional and local) and the development of networks across municipalities as a way to overcome their barriers.

The complex landscape of climate action and the increasing importance of cities in climate politics challenges traditional patterns of state-centric models of governing; the landscape is evolving into a polycentric structure, where multiple centres of power coexist (Arriagada et al., 2018), such as considers formal and informal networks, policy channels and multiple levels of governance (Lee & Koski, 2015; Di Gregorio et al., 2018; Johnson, 2018). The traditional 'cascade model' of global environmental governance has been criticised by Bulkeley and Betsill (2003) for its linear and hierarchical direction of power from the international regime to national, subnational and, finally, local governments. This model is based on the assumption that subnational governments act only under the guidance of national governments to implement environmental policies that are negotiated in the international regime, giving no agency to local governments and no recognition to the policy networks' influence.

Therefore, to recognise how local climate action impacts a region, it is necessary to consider the multi-scalar processes, the power structure (government), the power dynamics (governance) regarding the vertical levels of authority involved and the horizontal influences between the different institutions and actors involved in the area (Turcu & Gillie, 2019). Various scholars suggest the need for new theories to frame this process (Johnson, 2018), and governance approaches have become a fruitful field of study to contribute to the understanding of climate action. Cini and Bourne argue that the combination of a multi-level approach and the perspective of the policy networks are valuable to address 'the understanding of the system and how it works' (2006: 77), examining the different actors involved in the policy-making process.

This new governance landscape has been mainly studied by applying a multi-level governance (MLG) framework that explores the different scales of government structure: international, national, regional and local (Bache & Flinders, 2015). The MLG framework was firstly developed by Marks and Hooghe in 1996 to analyse the European Union governance and, since then, has been widely utilised in the literature regarding climate change actions (Lee & Koski, 2015). This approach offers to these studies 'an understanding of local decisions as a product of horizontal and vertical influences' (Ibid: 1501), including the vertical guidance from the nation-states to municipalities and the relations between different actors involved in the policy-making process.

Marks and Hooghe emphasize the advantages of this model in comparison with the hegemony of power from the nation-state (1996) and highlight the capacity of MLG to 'deliver public policy through collaboration with other between different tiers, and a resultant capacity to be innovative' (Cini & Bourne, 2006: 85). The MLG theory contains two related sets of processes that provide a comprehensive overview to analyse the climate change governance: Type I, the negotiation of authority and competences between different levels of authority (vertical influences); Type II, where multiple overlapping and interconnected spheres of authority are involved in governing particular issues (horizontal influences) (Bulkeley & Betsill, 2013).

Bulkeley and Betsill stated that, while some local governments were able to develop sufficient capacity and political will to overcome barriers implementing climate change actions at the local level, involving other actors in this process, other municipalities have 'many witnessed a growing gap between the rhetoric of a need for an urgent response and the realities of governing climate change on the ground' (2013: 140). Furthermore, they argue that:

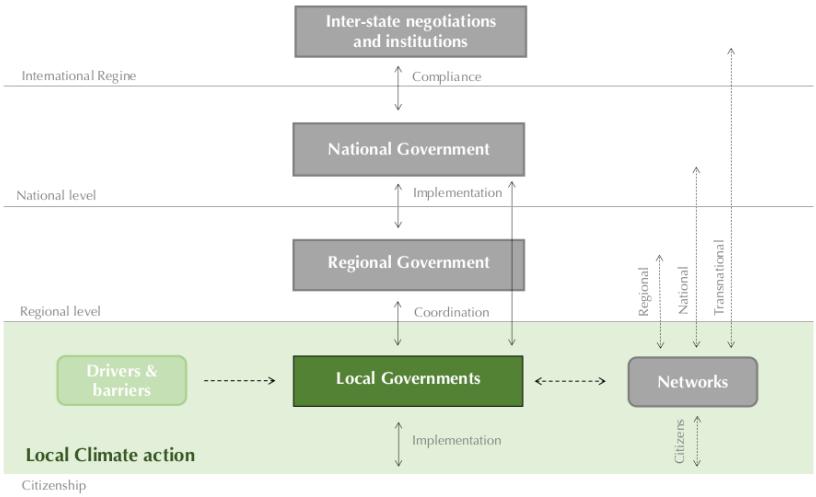
> While national and regional institutional and political contexts will continue to shape what it is and is not possible to address in climate change terms locally, the increasing complexity and fragmentation of climate governance suggests that there is a growing need to engage more critically with where the authority and capability for addressing climate change as an urban problem lie. (p.145)

Finally, Johnson (2018) illustrates how state and non-state actors, such as multinational corporations, NGOs and academia, are shaping the climate governance landscape, making evident the shift from multilateral governance (interaction between different states) to a multi-level and polycentric approach (multi-level and multi-actor interactions).

As Bulkeley and Betsill point out, the MLG framework provides a valuable approach to understand 'why moves towards urban sustainability are, and are not, taking place' (2005: 48). Later, they argue that it is helpful to 'take into account the multiple sites and processes through which urban responses to climate change were configured and contested' (2013: 138). Following this approach, it is possible to analyse climate governance as a political problem through a network of socio-spatial relations between different levels of power, agencies, public and private sector and citizens. As Lee and Koski argue, 'climate change is the quintessential MLG problem – the effects of climate change are individual to localities, but the causes are globally generated by a plethora of localities' (2015: 1512).

This dissertation follows the MLG framework to explore the role of local governments in the development of climate change policies (Figure 1) (Bulkeley & Betsill, 2003; Bulkeley & Betsill, 2013; Lee & Koski, 2015; Di Gregorio et al., 2019).

Figure 1: Framing Local Climate action through the Multi-level Governance (MLG) lens.



Source: Own representarion

III. Methodology

This dissertation develops a single case-study of the Santiago Metropolitan Region (SMR), with multiple units of analysis (52 municipalities) aiming to understand in depth the governance of climate mitigation action in the Chilean context. This approach was chosen because 'allow us to mine deep into the complexities of relationships and processes within urban governance structures' (Maginn et al., 2008: 18). As far as this author knows, this is the first account of actually existing Local climate action in Chile.

The research will mainly follow a qualitative analysis. However, since there weren't previous studies that collected current local climate action in the region, it was supplemented by quantitative methods to fill the knowledge gap and built a reference point from which start from. According to Carmona, 'many scholars in the built environment have gravitated to the use of case studies, precisely to marshal the benefits of applying different research techniques to one or more real life contexts' (2016: 79). As a consequence, the study considered proceeded in three phases: secondary data analysis, primary data collection and analysis and semi-structured interviews.

Secondary data analysis of the Santiago Metropolitan Region

The first phase of the research examined the administrative structure and the environmental governance of Chile. This research focus on one region to gather detailed information and '[advocate] the importance of local context and conditions which yield deeper insights into the complexities of urban sustainability' (Turcu & Gillie, 2019: 11). The sources of data were national policy documents from 2015 to 2019, as well as Chilean academic papers. The case was selected for four reasons:

1. Chile is a highly centralised country and it is well-documented that there is a concentration of resources in its capital, Santiago (Valenzuela-Levi, 2019). Therefore, the definition of policies implemented across the country is often taking place there. Hence, the SMR plays an essential role in the environmental agenda and a study of the climate action at the centre of the power will provide a good understanding of the national policy landscape.
2. The region is the most densely populated and has the highest carbon footprint of the country. With 7.36 million inhabitants, the region has over 40.5% of the country's total population (INE, 2017). Hence, the efficacy of mitigation action there is a worthy indicator of the ability of local governments to contribute to national targets.
3. The 52 municipalities of the SMR are very diverse, with a wide range of demographic, physical and environmental characteristics (Hidalgo Dattwyler et al., 2018). Therefore, this diversity gives a full appreciation of the complex landscape of Chilean climate change action.

4. Finally, as Santiago is the home city of the researcher, a close understanding of its administration, governance structure and politics will be helpful in structuring the analysis.

Primary data collection and analysis of local mitigation action

The data utilised to analyse the existing mitigation actions was collected during June and July 2019 through a survey that was sent to the 52 municipalities of the region, using the Right to Access to Public Information law. The municipalities were individually asked to inform about their environmental policies and local climate action (requested information in Annex 1) and were also asked to send all their policy documents around these matters. The survey was delivered through the Transparency Law platform of the Chilean government, through which public organisms are obliged to respond citizen's petitions and was answered by 51 municipalities (one rural municipality did not reply). This method was useful to provide a broad vision of the climate action of the region, counting with primary data of 98% local governments of the case study. With this information was built a database of the climate action landscape, where each data entry was assigned to a number (0=No; 1=Yes), allowing to detected trends, averages and comparisons. Furthermore, this stage permitted to build a summary of the emission-reduction strategies of all the municipalities.

With the information provided, the mitigation measures were classified and analysed, following the emissions reduction strategies types as defined by Boswell et al. (2012), looking to summarise the broad range of actions, programs and policies undertaken.

Semi-structured interviews

The final stage of the dissertation uses data gathered from semi-structured interviews to 13 public officials in charge of the Local climate action (9) or chiefs of the environmental departments (4), covering a 54% the municipalities implementing mitigation strategies. The sample considered a balanced representation of the municipalities regarding a physical centrality approach explained below. Furthermore, these interviews were complemented by including two key policymakers from different backgrounds: a senior representative of the NGO behind the creation of the Chilean Network of Municipalities for Climate Action, and the head of the Department of Local Environmental Management at the Ministry of the Environment, because they are the counterparts of local governments. The interviews were done by conference calls due to the distance between London and Santiago, during July 2019. As part of the methodology, confidentiality was granted to the interviewees. Therefore, codes were applied following the centrality approach:

- Inner Urban municipality 1 to 4: LG01, LG02, LG03, LG04
- Outer Urban municipality 1 to 5: LG05, LG06, LG07, LG08, LG09
- Rural municipality 1 to 4: LG10, LG11, LG,12, LG13
- The NGO representative and the Ministry of the Environment official were coded NGO and ME.

The interviews helped to examine understandings of climate governance, how the local climate action is frame in existing policies, explore the access they have to support and financing, among other topics, including the comprehension of 'the complexity and contradictions of policy processes' (Lancaster, 2017: 94). The interview survey for local public officials is available in Annex 2, and the two other interviewees used the same template changed according their context.

Limitations

All interviews were conducted in Spanish, recorded, transcribed and translated into English. Since this process was done by the author who is native Spanish speaker, language is one of the main limitations of this research. Some quotations might be difficult to read, as the interviewees used colloquial language and named very specific-context examples difficult to explain.

Ethics statement

This research project was conducted with full compliance of research ethics norms established by UCL policy. The interviewees were formally asked to participate by an invitation letter in Spanish sent by email (Annex 4). The author took responsibility to explain to the participants what the research would entail and prevented the potential problems by not disclosing names, job titles or organisations without the interviewees' written consent. For their part, they previously agreed to participate in the research by signing a consent form in Spanish (Annex 5). Additionally, the interviewees were allocated with identification codes to maintaining confidentiality and the most important quotations were summarised in a codebook (Annex 3). Moreover, there are no further ethical considerations as the researcher did not have a personal relationship with the interviewees. Finally, all records of interviewees were disposed of after the research was finished.

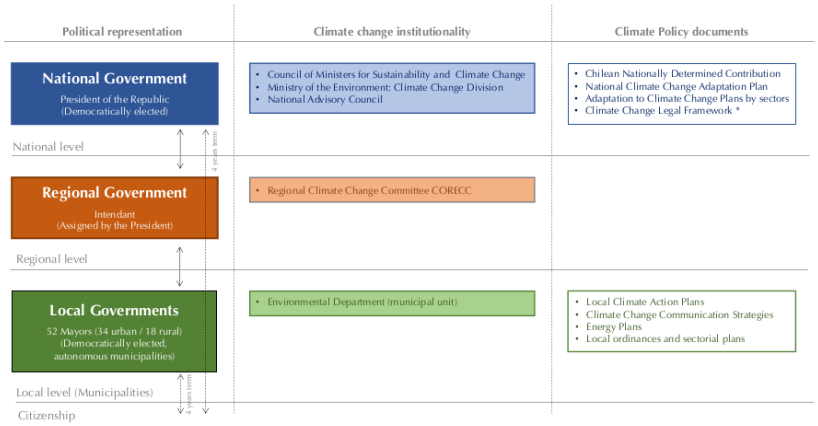
IV. Analysis of the Santiago Metropolitan Region

This section used secondary sources to analyse the most relevant aspects to contribute to the understanding of the climate action of the region: the administrative structure of the region, the environmental governance and an overview of the regional GHG inventory.

Administrative structure

From an administrative perspective, the region is led by the regional government, which is governed by the intendant. The intendant is not a democratically elected authority and is assigned by the President of the Republic. Therefore, this regional government is an extension of the national structure and is responsible for coordinating local and national policies. At the local level, the regions are divided in municipalities that are the local governments. In the case of the Santiago Metropolitan Region (SMR) is divided into 52 municipalities, with democratically elected mayors (Figure 2). Thirty-four of these municipalities are belonging to the urban area, and the other 18 correspond to the rural environment (Santiago Resilience Strategy, 2017).

Figure 2: Structure of the Santiago Metropolitan Region government.

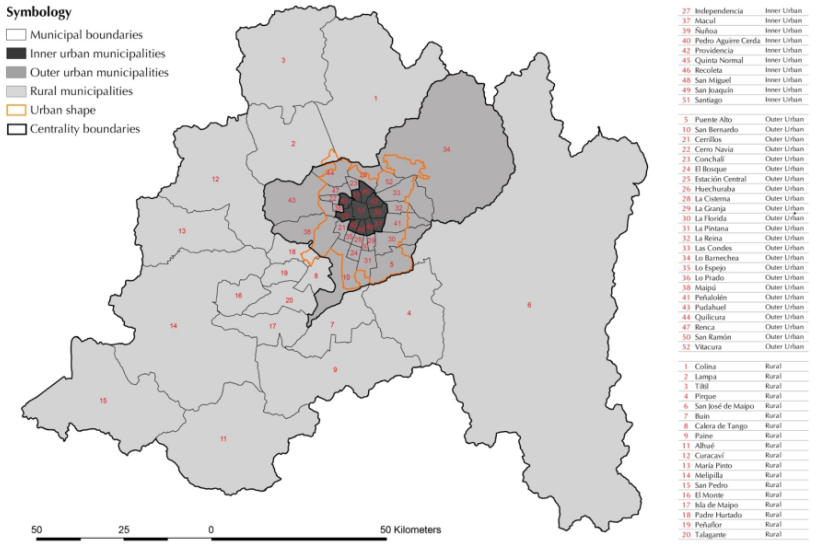


Source: Own representation

From a socio-spatial perspective, the rapid urbanisation of the region during the last decades has produced high levels of disparities, having inside the territory significant differences between different municipalities regarding infrastructure, urban facilities and sociodemographic characteristics (Hidalgo Dattwyler et al., 2018). These differences include local budgets as well, derived from the municipal financing system. Municipal budgets have three sources of financing: their own sources of revenue, a horizontal transfer system, which barely compensates for the difference between the revenues, and the National Fund for Regional Development, for financing specific projects (Liever & Gainza, 2018). However, 'the high dependence on commercial licences and property taxes reinforces the income gap between wealthier and poorer areas' (Ibid, p. 406).

Following the research of Hidalgo Dattwyler et al., this study utilised a zoning approach 'more qualitative and administrative reasoning that coincides with the action taken at the municipal level' (2018: 8). Under the zoning approach, this research grouped the municipalities into three levels of physical centrality (Figure 3): inner urban municipalities (10), outer urban municipalities (24) and rural municipalities (18).

Figure 3. Map of the region, classifying municipalities by zoning approach.



Source: Own representation

The municipalities with the highest urban qualities are in the inner urban area (downtown and surrounding municipalities), plus some wealthy municipalities located in the north-eastern zone (Vitacura, Las Condes, Lo Barnechea, La Reina y Peñalolén) (Hidalgo Dattwyler et al., 2018). On the other hand, the rest of the outer urban municipalities and rural areas lack high-quality public services and infrastructure (Ibid) and tend to have fewer municipal budgets derived from having less revenues, density and population, especially in rural areas (Liever & Gainza, 2018).

Environmental governance

In the Chilean context, environmental governance and climate change policies are relatively new. After signing the United Nations Framework Convention on Climate Change (1992) and specially after ratifying the Kyoto Protocol (2002), the country started to develop its environmental institutions, first at the national level and subsequently at the sub-national level (Harris et al., 2019). During 2010, the Ministry of the Environment, the Council of Ministers for Sustainability and the Office of Climate Change were created, among other environmental institutions located at the national level. Together with these significant changes at the national level, the local governments also incorporate new functions related to environmental action. However, despite these steps, the weakness of local environmental management still persists (Henríquez & Barton, 2012).

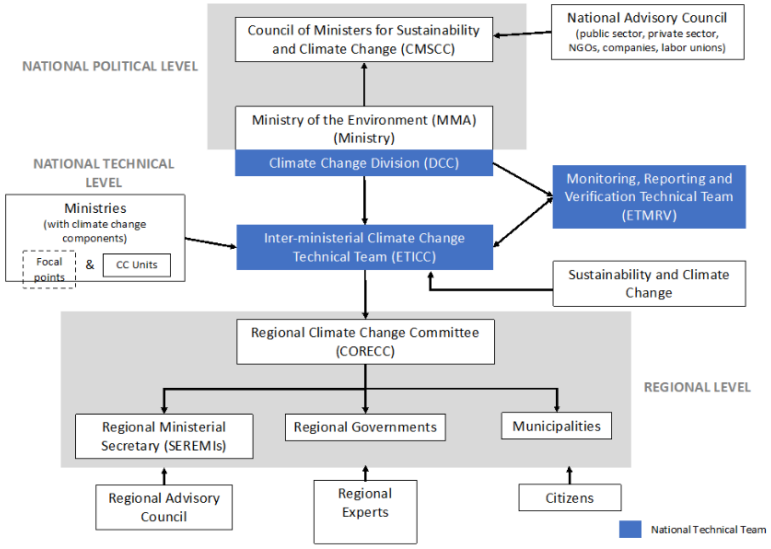
From a governance perspective, the environmental policies and climate actions are centred mostly in the national government. However, multi-level climate change governance has been increasingly strengthened by the recent policies implemented in the country. The most important means to promote this multi-level approach was the Intended Nationally Determined Contribution on Climate Change (2015) and the approval of the National Climate Change Adaptation Plan 2017–2022 (Arriagada et al., 2018). Based on the latter, emerges a subnational institutionality incorporating the Regional Climate Change Committee (CORECC) and the Inter-ministerial Climate Change Technical Team (ETICC). The first one is responsible for coordinating local action with national policies and incorporating public participation; the second aims to gather climate expert from public institutions (Harris et al., 2019). These committees aim to promote the implementation of climate policies emanating from the regional and local levels, as well as those supported by the national government (Ibid). This structure is shown in Figure 4.

The research developed by Harris et al. points out that this new institution has the potential to promote multi-level governance (MLG) and intersectoral coordination. According to their study, the Regional Climate Change Committees ‘represents a new type of subnational climate institution that has the

potential to act as a key interlocutor to territorialise national public policies on climate change, while galvanising the efforts of different territorial actors in a regional planning process' (2019, p. 3). However, they identified the main gaps in this new climate governance structure and highlighted the need to improve integration at the national–regional scale and the need to strengthen social participation around policy-making processes.

In the case of the SMR, despite the creation of the Regional Committee in 2018, the interviewees had little knowledge about how it works this new structure. Indeed, some of them explained the inactivity of the Committee due to the overwhelming process of preparing the Climate Change Framework Law and organising the COP25 meeting in parallel.

Figure 4. Chilean Multi-level Climate structure based on National Climate Change Adaptation Plan.



Source: Harris et al., 2019

Greenhouse gas emissions in the region

The GHG emissions inventories provide a baseline from which to measure progress toward climate mitigation commitment, disaggregating the data by source of emission (Boswell et al., 2012). Based on the Kyoto Protocol, most of the accounting GHG inventories are production-based, despite the growing critique of the technical literature to incorporating consumption-based inventories into climate policy (Peters, 2008).

GHG inventories are well documented at the national and regional levels (by the National Greenhouse gas Inventory System at the Ministry of the Environment), but local governments do not count with their own GHG emission data to establish a baseline (Ministerio de Medio Ambiente, 2017b; Vicuña & Bustos, 2017). According to a report of climate change in the SMR, the most significant GHG emissions of the region belong to the Energy sector (Industrial + Public and Commercial sectors + Transportation), representing 84.7% of regional emissions (Table 1), mainly due to the large population living in this area (Vicuña et al., 2017).

Table 1. GHG emissions of Chile and Santiago Metropolitan Region.

Sector	Chile (Gg CO2e)	(%)	SMR (Gg CO2e)	(%)	SMR/Chile (%)
Industry and generation emissions	52,128	52%	2,849	19%	5%
Ground Transport emissions	23,925	24%	7,176	48%	35%
Other emissions by Combustion	5,769	6%	2,525	17%	44%
Agricultural emissions	13,735	14%	571	4%	4%
Waste emissions	4,478	4%	1,689	11%	38%
Total emissions	100,035	100%	14,809	100%	15%

Population [inhabitants]	17,450,142	7,069,645	41%
Gross Domestic Product [MM CLP]	137,229,576	62,063,296	45%

Source: Own representation based on Vicuña & Bustos, 2017

Both Industrial and Agricultural activity have lower emissions compared to the rest of the country. Industry emissions in the region represent 19.3%, while in the country, they correspond to 52.1%. This difference is explained by the fact that the region limited fuel-intensive Industry and has access to a less amount of emitting fuels such as natural gas (Vicuña & Bustos, 2017). Therefore, the result is significantly fewer emissions. However, while the region only emitted 5% of the national emissions in the Industry sector, the region's electricity consumption implies an additional 16% of CO2 emissions in the other areas of the country. On the other hand, the weight of the Waste sector in the region stands out. While, at the country level, the emissions of this sector weigh around 4.5% of national emissions, in this region,

they represent 11.4%. Waste emissions could be explained by the direct relationship that exists between the population and high density compared to the rest of the country. The comparison of per capita emissions points to a lower level of emissions per inhabitant (5.7 tons/inhabitant nationwide vs 2.1 tons/inhabitant). However, this difference would be explained to a large extent by the difference in the level of emissions from Industry, Energy generation and the Agricultural sector (Vicuña & Bustos, 2017).

In a nutshell, the SMR follows the global pattern. Cities consume as much as 75% of the energy produced worldwide and emit 80% of global GHG emissions (Boswell et al., 2012). Energy, Transport and Waste are the sectors with the highest GHG emissions in the region. Hence, the priority areas for the local mitigation plans are closely related to the urban shape, regarding compactness, density, polycentricity, and other physical features (Makido et al., 2012).

Finally, it is essential to highlight the fact that the National Greenhouse Gas Inventory System is based on regional data; there is no longitudinal data available at the local level. Consequently, it is challenging to measure the specific contribution of each municipality to reducing GHG emissions. To be able to do this detailed analysis would depend on counting with local inventories prepared by each municipality.

V: Findings and discussion

This section presents the results of both quantitative and qualitative research methods. The section combined the outcomes of the study with their interpretation, highlighting the most significant findings and relating them to the literature. The first subsection is based on the quantitative data obtained from the survey answered by 51 municipalities, looking for significant trends to illustrate the climate action landscape of the region. The following subsections are drawn on the qualitative analysis from the interviews and are structured by subjects studied in governance literature: drivers and barriers, vertical and horizontal influences and guidance to local action.

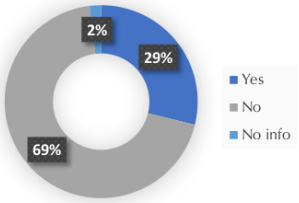
The climate action landscape in the Santiago Metropolitan Region

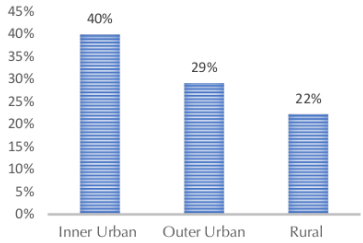
Thanks to the data collected, it was possible to build a baseline of the emerging climate action in the region, from where study the governance process. According to the data, local climate action in the SMR is relatively new. The first antecedent dates from four years ago and most of the actions have been carried out in the last two years. Twenty-four out of 52 municipalities of the region have implemented mitigations strategies, which represents 46% of the municipalities. Twenty-two of them have sustainable development strategies incorporated into their Communal Development Plans (PLADECO), which is the most important policy instrument to guide local policies and a way to integrate sustainable pathways into all their policies.

The most common action developed by local governments to contribute to GHG emissions reduction is carbon sequestration (54% of the municipalities), through planting native trees. Most of these actions have been made in alliance the government agency CONAF (National Forestry Corporation). However, these actions are not always inside a mitigation plan. Accordingly, just 15 municipalities count with a local climate action plans, equivalent to 29% of the municipalities (Figure 5).

Notably, a relation between centrality and climate plans can be observed. As shown in Figure 6, while 40% of the inner urban municipalities have a CAP, only 29% of outer urban municipalities and just 22% of rural municipalities have implemented it. This probably can be explained by the significant differences between local governments, their technical teams and budgets, as well as urban-rural disparities discussed in the analysis of SMR.

Figure 5. Implementation of CAPs in the region.
Figure 6. Participation of CAPs by centrality.

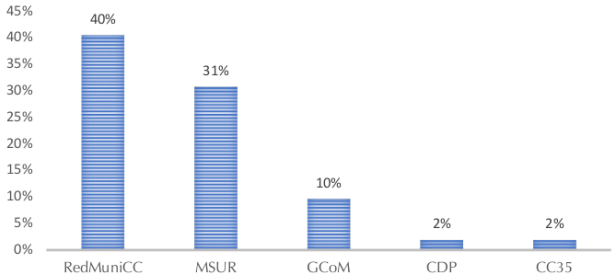




Sources: Own representation, based on survey

Networking appears to be decisive in local climate action. Thirty of the municipalities participate in at least one environmental network and all of the municipalities that have implemented a CAP are part of a network. Therefore, there is a strong relationship between the support provided by these networks and the capacity of the local governments to implement climate change agendas. Figure 7 shows the percentage of participation in the region by type of network. The network with more partnerships is the Chilean Network of Municipalities for Climate Change (REDMUNICC), having 21 partners and accounting on the 40% of all the municipalities. Another important network is the Metropolitan Association of Municipalities of South Santiago for the Environment and Waste Management (MSUR), with 16 municipalities participating (31%). Then, there is the Global Covenant of Mayors for Climate and Energy (GCoM), working with five municipalities, mainly from the wealthy area. Some municipalities participate in one network (20) while others participate in two at the same time (9). Finally, there is one municipality more connected than others, Santiago, participating in five networks.

Figure 7. Participation of Environmental Networks in the region.

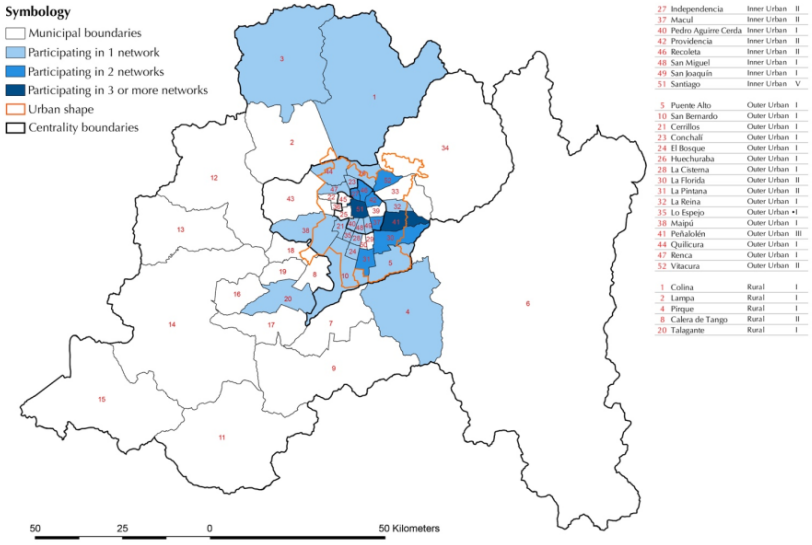


Source: Own representation, based on survey

Additionally, the urban–rural disparity can be observed in the connections of the municipalities with environmental networks (Figure 8). While the participation of the overall region is 58%, the differences between municipalities regarding centrality are remarkable. On the one hand, 28% of rural municipalities participate in environmental networks. On the other hand, 71% of outer urban and 80% of inner urban municipalities are members of any network. Centrality, in the case of the SMR, appear to mean power and connections. As noted by Bulkeley, 'in effect, networks and partnerships appear to be more important for those with a degree of existing capacity to act, leading to a virtuous circle where additional resources and support can be accessed' (2013: 135).

The multi-level climate action of the region includes 24 local governments working in partnership with non-state actors, including NGOs and consulting companies to incorporate external know-how. The most influential non-state actor is the NGO Adapt-Chile, promoting the creation of local climate change plans across the country, providing a methodology and technical support to local municipal teams. It should be noted that Adapt-Chile founded the Chilean Network of Municipalities for Climate Change (REDMUNICC) and plays an essential role in the connections between the local governments with upper levels and external support.

Figure 8. Spatial distribution of environmental Networks in the Santiago Metropolitan Region.



27	Independencia	Inner Urban	II
37	Macul	Inner Urban	II
40	Pedro Aguirre Cerda	Inner Urban	I
42	Providencia	Inner Urban	II
46	Recoleta	Inner Urban	II
48	San Miguel	Inner Urban	I
49	San Joaquín	Inner Urban	I
51	Santiago	Inner Urban	V
5	Puente Alto	Outer Urban	I
10	San Bernardo	Outer Urban	I
21	Cerrillos	Outer Urban	I
23	Conchalí	Outer Urban	I
24	El Bosque	Outer Urban	I
26	Huechuraba	Outer Urban	I
28	La Cisterna	Outer Urban	I
30	La Florida	Outer Urban	II
31	La Pintana	Outer Urban	II
32	La Reina	Outer Urban	I
35	Lo Espejo	Outer Urban	•I
38	Maipú	Outer Urban	I
41	Peñalolén	Outer Urban	III
44	Quilicura	Outer Urban	I
47	Renca	Outer Urban	I
52	Vitacura	Outer Urban	II
1	Colina	Rural	I
3	Lampa	Rural	I
4	Pirque	Rural	I
8	Calera de Tango	Rural	II
20	Talagante	Rural	I

Sources: Own representation, based on survey

Local climate action is guided, in the majority of the cases, by the national government through their programs and funding. In addition, the NGO Adapt-Chile is also contributing to engaging in local action, providing technical support to the local team for the creation and implementation of local climate plans in municipalities belonging to REDMUNICC. Table 2 summarises these policy instruments.

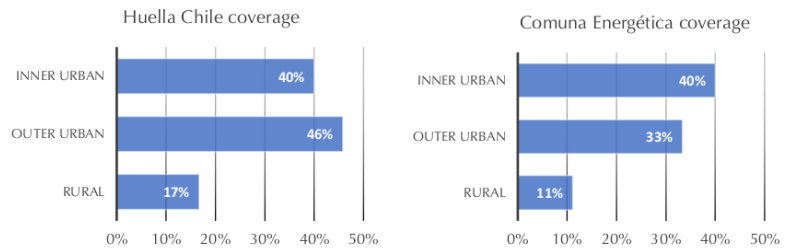
Table 2. Policy instruments overview.

Instrument	Partnership	Description	Presence in the region
Municipal Environmental Certification (SCAM)	Ministry of the Environment	This certification seeks to integrate environmental concerns in the municipal work and services provided to the community. It is a gradual system, and the final is focus on climate governance. It can be considered the first step of local climate action and is the most widely spread instrument. Created in 2009.	49 municipalities enrolled (94%)
			12 municipalities enrolled during 2019
			5 municipalities achieve the final seal
Carbon Footprint Reduction Strategy (Huella Chile)	Ministry of the Environment	This program promotes the calculation, reporting and reduction of GHG in public and private sector organisations. This program is developed in partnership with Germany, Spain, the European Union and the United Nations. Created in 2016.	18 municipalities enrolled (35%)
Local Energy Plan (Comuna Energética)	Ministry of Energy	This instrument aims to contribute to the energy development of Chile. The program analyses the energy scenario of each commune and launches projects that allow the potential for energy efficiency and use of renewable energies from the local community. Created in 2015.	14 municipalities enrolled (27%)
Local Climate Change Plans (PLCC)	REDMUNICC and NGO Adapt-Chile	These plans are internal planning instruments of the municipalities, developed to integrate and implement climate change mitigation and adaptation. Created in 2015.	15 Local Climate Plans implemented (29%)
			8 of the Local Climate Plans just started in 2019

Source: Own representation based on program´s websites: 1) https://educacion.mma.gob.cl/; 2) https://huellachile.mma.gob.cl/; 3) http://www.minenergia.cl/comunaenergetica/; 4) https://www.redmunicc.cl/

The coverage of the Municipal Environmental Certification is widely spread in both rural and urban municipalities. However, there are differences between the standard and the seals obtained between local governments. Consequently, higher seals are concentrated in inner urban municipalities. Additionally, looking to the other instruments provided by the national government, climate action is mostly focused on urban areas (Figure 9).

Figure 9. Participation in national government programs by centrality.

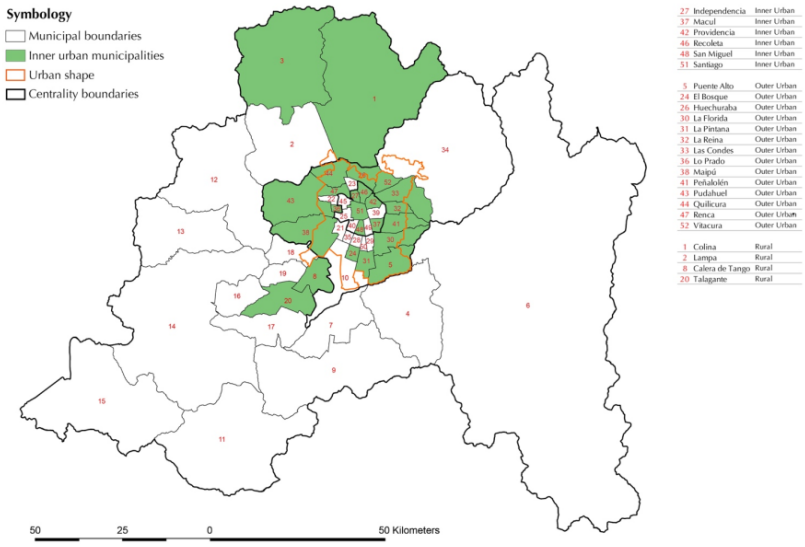


Source: Own representation, based on survey

Regarding the spatial allocation of mitigation policies, a direct relation with the uneven distribution of resources inside the region can be observed. Inner urban municipalities and wealthy areas (the north-eastern zone) are where most of the economic recourses are concentrated; these tend to be the same regions as those implementing mitigation policies and have the most robust connections with environmental networks and non-state actors. Figure 10 shows the tendency, spatialised in the map of the region.

As a consequence, there are significant challenges ahead for a fairer distribution and coverage of climate action across the SMR, without any climate policies implemented in a large proportion of the territory.

Figure 10. Spatial distribution of Mitigation policies in the Santiago Metropolitan Region.



Sources: Own representation, based on survey

According to Boswell et al., the 'reduction strategies are usually organised in sectors similar to the emissions inventory' (2012: 128) and should follow the hierarchy of the available inventories to contribute effective reductions. In the case of the SMR, the GHG emissions are mostly concentrated in the Transport, Energy and Waste sectors. On the other hand, the emission-reduction strategies implemented in the region by local governments are primarily focused on Waste management and recycling (92% of mitigation strategies), Energy Efficiency and Renewable Energy (75%), Carbon Sequestration (63%) and Transport (54%). Far behind are the strategies related to planning and the built environment, like green infrastructure, change in land use patterns or green building requirements in planning applications (Table 3).

Table 3. Emission-reduction strategy sectors (table just with the municipalities with mitigation actions)

Municipality	Classification according to centrality	Waste	Energy	Carbon seq.	Transport	Water	Green infra.	Land use	Green Build.
Providencia	Inner Urban	✓	✓	✓	✓	✓			
Independencia		✓	✓		✓				
Santiago		✓	✓	✓	✓				
Macul		✓		✓	✓				
Recoleta		✓	✓						
San Miguel		✓			✓				
Peñalolén	Outer Urban	✓	✓	✓	✓		✓	✓	
Renca		✓	✓	✓	✓		✓		
Vitacura		✓	✓	✓	✓	✓			
Puente Alto		✓	✓	✓			✓		
La Reina		✓	✓	✓	✓				
Maipú		✓	✓	✓		✓			
Quilicura		✓	✓	✓	✓				
Huechuraba		✓	✓						
La Florida		✓	✓						
Las Condes		✓			✓				
Lo Prado		✓	✓	✓					
Pudahuel		✓	✓						
El Bosque			✓						
La Pintana		✓							
Colina	Rural	✓		✓	✓		✓		
Lampa			✓	✓	✓	✓			
Calera Tango		✓	✓	✓		✓			
Talagante		✓		✓					
Total		**92%**	**75%**	**63%**	**54%**	**21%**	**17%**	**4%**	**0%**

Source: Own representation based on survey

There is no straight relation between the inventory and the strategies undertaken by local governments. Instead, the emission-reduction sectors are related to the duties of the municipalities and the areas where they have more capacities (power) to implement these measures (Bulkeley, 2013). This denotes a pragmatic vision. In the case of Waste and recycling, while Waste is not the most significant GHG

emitter in the region, it is the sector that receives most of the attention when it comes to reduction strategies. This is closely related to the fact that the household waste collection is a responsibility of municipalities, defined by the Organic Law of Municipalities (Valenzuela-Levi, 2019). Despite the fact that 54.8% of local governments in the country and 42.9% of the region have recycling policies, most of them have been recently implemented, and still 'separate collection is much lower than any other OECD country with available data' (Ibid: 8).

The case of mitigation measures related to the Transport sector is also illustrative. Transport is the most significant GHG emitter in the region and most of the measures are controlled by the Ministry of Transport and its regional undersecretary, considering multiple-scale interventions. On the other hand, the local transport strategies are focused on bicycle and pedestrian infrastructure, bike share programs and municipal electric vehicles, mostly. These interventions require less budget or are related to existing duties, as a way of improving existing policies.

Finally, respect to the Energy-based mitigation actions, all of them are part of the Energy Plans developed within the Ministry of Energy, based on introducing renewable energy to public buildings and public lighting, as well as energy efficiency measures.

Drivers and barriers to implement local climate action

For a better understanding of the context, interviewees were asked to identify drivers and barriers to performing climate actions in their territories. Identifying them is important to comprehend the governance of climate change, because MLG is a way to overcome those barriers (Bulkeley, 2013).

When asked about the drivers to implement local climate action, two of them repeatedly emerge in most of the interviews. These drivers appear without distinction in centrality or municipal budgets: political will and citizen demand. Both were identified as the most powerful assets to technical teams inside the municipalities.

Firstly, there is political will and the influence of the Mayor´s vision. Almost all the municipalities developing local climate action and mitigation policies in the SMR start with the political commitment and leadership of the Mayor, supporting firm commitments in environmental policies. Thus, 9 of the 15 interviewees indicated political will was the most powerful driver.

> It is evident that the political gaze and the vision of the mayors is necessary for the problematic of climate change to be important in the municipalities. (LG02, Inner Urban)

Secondly, there is a growing public demand for environmental policies and local climate action. Linked to the above, this may explain the political interest of mayors. However, it was mentioned only in the interviews to the urban municipalities' officers. The difference between urban and rural citizens will become more evident when the citizen factor of environmental policies deepens in the multi-level analysis.

> There is a very active citizen scenario. The people have a high-level environmental awareness. And in the end, it is not only an activist but also being committed, understanding the processes and want to improve. (LG01, Inner Urban)

The third driver is vulnerability to climate change and problems in the territory regarding climate change are also drivers. These drivers were very strong in some interviewees, especially those from outer urban and rural municipalities. Climate change impacts are a threat that local governments need to face urgently. Therefore, it becomes necessary to implement CAPs to guide the local action in adaptation and mitigation.

> The main motivation is that we are a highly vulnerable commune, with very poor-quality infrastructure. So, that makes that any extreme weather event has a much greater impact on citizenship. In that sense, it is essential to have an action plan to reduce those impacts. LG07, Rural municipality)

On the other hand, barriers were identified more transversely by the interviewees and appeared to be related to the local capacity to address local climate action in terms of power and resources. The concept 'local administration vs local government' was repeated during many interviews to express the lack of power of municipalities to develop a strong climate change agenda.

> We should be more local governments and a little fewer local administrations (...) as was stated, the battlefield of climate change is at the local level, and if so, the local government should have more power and resources to face it. (LG12, Rural Municipality)

Consequently, the lack of resources of local authorities and lack of professionals inside the municipalities to develop and implement local climate action were the core barriers mentioned. Boswell et al. stated

that finding money to perform local climate actions 'can be the most challenging aspect of implementation' (2012, p.189), because it must compete with all the other needs of the communities. Having said that, in the context of a developing country, this limitation is even more relevant.

> From the national government, they have been delegating each day more tasks, more functions, more responsibilities, without allocating in financial resources to be able to meet the objectives, goals, tasks assigned to us. (LG10, Rural Municipality)

Moreover, lack of external funding is problematic in municipalities with constrained budgets, especially considering the uneven distribution of the recourses in the territory. Therefore, more impoverished communities can be expected to have less capacity to implement climate policies (Valenzuela-Levi, 2019).

> There are municipalities that have a budget that is more than CLP 1,000,000 per capita compared to others that have CLP 190,000 per capita. So obviously, the budget that is available to finance plans and programs and concrete actions it is very different. (LG02, Inner Urban)

Resources-related barriers are closely associated with the reality of the Chilean political structure. Attributions and resources are centralised at the national level. Hence, financing local climate action depends largely on definitions taken from the national government.

> There is a structural issue of how we organise as a country that is not working, with this excessive centralism. And it is well known that Climate change needs to be approached with a decentralising and local point of view, to return to work on a territorial scale, with greater autonomy, with more attributions and resources. (NGO)

In addition, from the Ministry of the Environment official perspective, being a country member of the OECD is problematic in terms of fundraising and 'inhibits the international cooperation' (ME). Most of the members of this organisation are developed countries that have a high-income economy and, from the interviewee's perspective, international funds don't give priority to funding OECD members.

> For instance, Japan financed several municipalities on this issue, but now it does not because Chile is an OECD country. Therefore, being an OECD country has hurt us in international financing. (ME)

Also, the interviewee from the NGO expressed that the Green Climate Fund defined that Chile will not receive donations, only loans. However, the Organic Law of Municipalities establishes that local governments are not able to acquire loans (Pacheco et a., 2013). This is a vicious circle and maintains the dependence of local action on national policies.

Besides these external barriers, local climate action also faces challenges inside the local governments. As stated by Bulkeley, 'institutional factors are those that shape the capacity of institutions to address climate-change mitigation' (2013: 132). It is seen by the majority of the interviewees that the lack of coordination within different municipal departments and other in-house obstacles are significant barriers to overcome. Moreover, from an administrative perspective, climate action is often hosted inside the Municipal Service, which is an operative department. According to the majority of interviewees, climate change teams should be hosted in the Planning Department or other strategic departments.

> Of the most important, basically the internal coordination here in the municipality, which we need to strengthen because the truth is that today it is challenging to reach the rest of the units, their respective teams (...) Because obviously, we as a department alone will not be able to develop all the actions. (LG10, Rural Municipality)

The same diagnosis is shared with the interviewees from the NGO and the Ministry of the Environment, who witnessed this from their counterparts. In fact, Adapt-Chile requests that local governments developing local climate action plans incorporate different departments in the creation of the plan. The aim is to transform the local climate action into a cross-cutting objective. As well, the Ministry of the Environment, through the Environmental Certification Process, demanded the formation of an Environmental Committee, with the participation of all directors of the municipality to encourage coordination on environmental policies.

> In the municipalities, there is great atomization and many times the department next door is not aware of what the other is doing, and they should be coordinated. They should be doing synergy, but they do the opposite. (NGO)

Vertical and horizontal influences on local climate action

When local governments lack direct powers to develop and implement climate change policies, both vertical and horizontal forms of MLG become critical to enabling conditions to local climate action (Bulkeley, 2013). The climate change structure created by the national government through the National

Climate Change Adaptation Plan seems to be an opportunity for polycentric and MLG (Arriagada et al., 2018). Considering the above, the interviewees were asked to explore the current relations between local governments and upper-levels, horizontal networks and citizenship, examining the quality of the connections and the influence in the local action.

First it is necessary to look up into the hierarchical structure, with the implementation of state-level climate action to promote local climate action (Lee & Koski, 2015). The relation between local governments and higher levels appears to be based on compliance with plans and programs, rather than a collaborative approach. In fact, financing seems to be the most reliable link.

> We develop projects, and the collaboration [with upper-level governments] arise through specific funds, but it is not an institutionalized process of working together, strategic planning or things of that style. (LG01, Inner Urban)

Moreover, the certification process implemented by the Ministry of the Environment is a powerful tool to progressively guide Local climate action from the national level. At the same time, it has been the way in which the ministry implemented an environmental structure in local governments, promoted the climate change policies and encouraged the interaction between different state programs.

> Today, we are working to obtain the "Outstanding" seal [in Municipal Environmental Certification], and the certification process is requesting the link with energy efficiency (...) also it is a requirement to be enrolled in "Huella Chile" and calculate our carbon footprint for obtaining this higher seal. And that helps us, because our climate action is becoming stronger and will open the way to continue walking. (LG04, Inner Urban).

Despite the new climate change structure created for regional institutions, the Regional Climate Change Committee (CORECC), local governments don't have any relation with it yet. In fact, no interviewee answered that they have been coordinating with this institution. Surprisingly, more than one of interviewees didn’t know the existence of this institution, although it was created in 2018.

> The CORECCs are a significant figure, but up to date, I don't really know what they are doing, what they are working on or what they are contributing. (LG02, Inner Urban)

Secondly, there are many horizontal influences. Lee & Koski conceptualise horizontal influences as ‘city-level commitments to other municipal climate change organization’ (2015: 1507). From the interviews,

it can be argued that working in partnership with networks and non-state actors provides external support to develop and implement local climate action. This support includes a wide range of areas: technical assistance, sharing information, providing external resources and political connections. Another input is giving visibility to technical teams inside local governments, which was well-evaluated by the interviewees. Horizontal MLG is very important to support local effort that the national government encourages.

> 'And, obviously, we work in coordination with Adapt-Chile and other institutions (…) It is a fairly small circle and very collaborative, not competitive, and that is extremely positive. I will never take the spaces away from Jordan [NGO Adapt-Chile executive director]. We try to encourage them because we know it is not enough with our effort.' (ME)

Two networks were the most relevant for the interviewees: the Chilean Network of Municipalities for Climate Change (REDMUNICC) and the Global Covenant of Mayors for Climate and Energy (GCoM), recently introduced in Chile. While REDMUNICC is the most collaborative platform in the region regarding climate action, GCoM was highly valued as a validated institutional framework.

> The Chilean Network of Municipalities for Climate change has been the most effective communication platform with the rest of the municipalities. And that helped us to communicate, either through the workshops or through the WhatsApp group. We are constantly giving tips and requesting recommendations between the municipalities. (LG07, Outer Urban)

> With the Global Covenant of Mayors, we are doing an intense work. We are working on the measurement of impact, indicators, and so on. And a compelling action report is being made. It has a much greater depth than the Chilean Network does. (LG02, Inner Urban)

Finally, looking to the citizenship. As was stated before, the growing demand for environmental policies is one of the drivers of local climate action. According to Homsy and Warner, civic capacity is a crucial driver for polycentric action, defining it as the 'way that local governments can supplement their ability to craft or implement policy through the use of citizen-based expertise' (2015: 51). Indeed, all the municipalities interviewed have formed a Community Environmental Committee, because it is one of the requisites to obtain the first seal of the Municipal Environmental Certification. However, there different valuations of the citizen contribution to environmental management emerged among interviewees from urban and rural areas. In urban areas, citizens are seen as demanding and very actives into the local climate action.

> The Community Environmental Committee is very active; in fact, there are neighbours that offer free studies for the municipality and organise events. This is the case that I know more closely and where I see that there is a very empowered citizenship, and that is driving and encouraging the municipality to go further. (LG01, Inner Urban)

Conversely, in rural areas, citizens are seen as uninformed by interviewees and local governments play an educational role to introduce climate change awareness.

> I imagine that because of ignorance or because it is something new, something that comes to change a lot of schemes (...) In fact, one of the activities that the local climate action Plan consider is to disseminate this effectively. (LG11, Rural Municipality).

Despite the differences in the environmental awareness, all municipalities support their climate action with public participation. They are investing time and resources disseminating environmental knowledge to their citizens, including educational programs in public schools, neighbourhood committee and community groups.

> We have an environmental education centre called "Ecoparque", where we have daily contact with people from all over the community, from the school level to adults (...). There we can test how people see environmental matters, have focused instances on discussing climate change and small focus groups. (LG06, Outer Urban)

Use of indicators and GHG inventories

In order to assess the contribution of local governments to national mitigation commitments, the interviewees were asked to explore the use of indicators and GHG reduction measurements. This exploration allowed the study to link the governance process with the impact of the climate policies.

Within the MLG perspective, how upper levels guide the implementation of local policies is essential to take into consideration (Bulkeley & Betsill, 2003). Contemporary discourses of governance understand the use of indicators is a means for actors from higher levels to engineer specific outcomes (Rydin, 2007). In that sense, indicators are not only seen just evaluations and calculations of policy implementation, but also a means to influence the policy domain. In the interviews, two forms of indicators can be distinguished: indicators associated with the provision of resources and knowledge and indicators

related to assessing the performance of the mitigation measures. In the words of Turcu (2013), these two kinds of indicators could be called as 'science-light' (policy and decision-makers) and 'science-heavy' (technocrats, scientists).

> For each measure, monitoring and compliance indicators are established. We do not ask them [Local governments] to elaborate impact indicators and even fewer mitigation measurements. But we do ask them to report once a year, the fulfilment of the compromised measures (...) They are using monitor indicators, not impact indicators. (NGO).

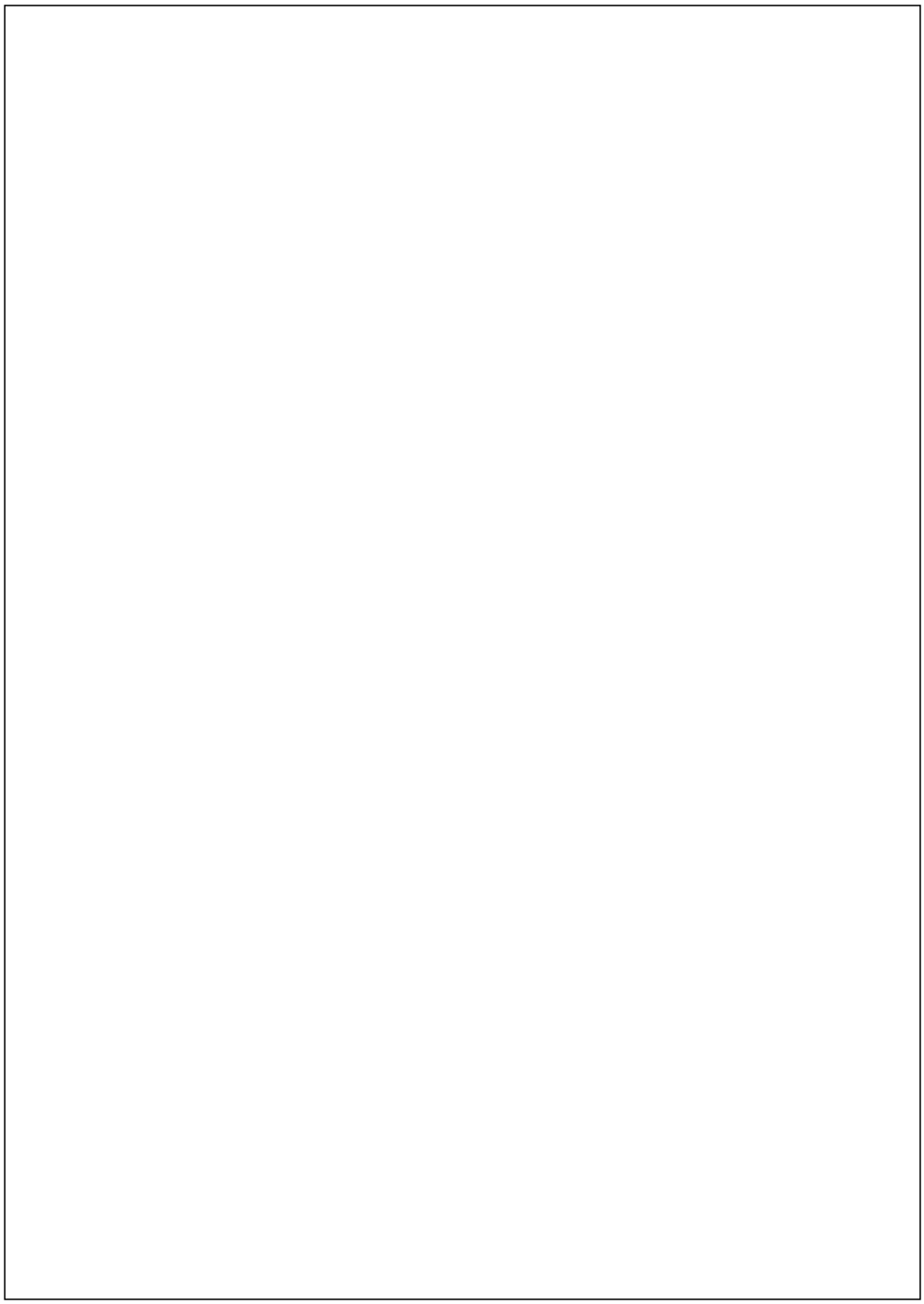
> In this framework, we are generating different types of indicators. Most of them are of processes first, then goals and now we want to link them to the NDC. (ME)

As was stated previously, most of the local climate action is framed in four policy instruments. Local governments implement these instruments with the guidance of national governments or supported by the partnership of the Chilean Network of Municipalities for Climate Change. All these policy instruments are associated with specific accountability tools and focus on concrete deliverables. Therefore, it is possible to affirm that vertical and horizontal influences are setting the local climate agenda.

Regarding the impact of the mitigation policies implemented, the literature mentioned different methodologies, tools and metrics with which to measure GHG emission reduction actions (Boswell et al., 2012; Bulkeley, 2013). In the case of the SMR, most of the mitigation policies are measured with monitor indicators, focusing on actions and activities undertaken. In the case of GHG reduction policies, they are mostly measured with the Carbon Footprint assessment, through the assistance of the 'Huella Chile' program, which is mostly applied to public buildings and street lighting.

> That is why it is super difficult to make a territorial measurement of the carbon footprint, but we are making one at the institutional level. And as I said, unfortunately, in Chilean plans, not only ours, today we measure the success in the fulfilment of the actions and not so much as they contribute to climate change mitigation. (LG06 Outer Urban)

Finally, from the interviews it can be concluded that the relative disuse of measurements to track GHG emissions reductions reflects the incipient landscape of local climate action. Furthermore, the lack of technical capacity and institutional challenges are creating barriers to assessing the contribution of the local mitigation policies to the national GHG reduction commitments.



The final challenge is the integration of climate action into the strategic planning of municipalities. Although having a growing local climate action in the last four years, it still a voluntary contribution and not a municipal responsibility defined by the Organic Law of Municipalities. Based on this research, it may be said that the local climate action is not placed inside the strategic vision of the municipality and mitigation measures continue to be a group of initiatives from the Environmental Department and remain un-coordinated with the rest of local policies. Indeed, all of the interviewees emphasised the internal challenges they face when implementing mitigation policies.

Most of the interviewees identified that counting on the political commitment of the mayors is a powerful driver to establish climate policies. Conversely, none of them identified that climate-change policies could generate different benefits for the community, despite the fact that this approach is widespread and emphasized in the National Climate Change Adaptation Plan. In fact, just the NGO representative claimed the importance of understanding climate change policies beyond an environmental issue, involving a discussion of the model of development of the territory.

Eventually, understanding the strategic contribution of climate action to the territory and the value that could add to municipal duties could help to overcome the barriers associated with institutional capacities (Boswell et al., 2012). This seems to be an opportunity to locate local climate action in the broad municipal agenda, integrating climate change, urban planning and strategic development policies.

As mentioned in the introduction, the relation between climate change and cities has been widely studied in developed countries, most of them counting with climate policies implemented a long time ago. The contribution of this dissertation is providing empirical evidence-based research for a better understanding of the climate governance dynamics in a developing country, where climate policies are emerging. Through a MLG perspective, this study provides a comprehensive vision of local climate action in the SMR.

The findings of the study illuminate critical issues that should be acknowledged in future research. On the one hand, the potential for more in-depth analysis of the mitigation policies using the database created from the municipal survey. This study used this information to find the most important trends of the Local climate action before examining climate governance with qualitative analysis. However, the amount of data available (from the survey and policy documents provided) allow planning a new research itself. This approach should be more technical and detailed the application of indicators and

measurements. On the other hand, considering the uneven municipal powers and their relationship with upper-level governments, networks and non-state actors, it would be interesting to incorporate the 345 municipalities of the country into a new study, especially considering the highly centralised governance structure. If notable differences were identified between the municipalities in the country's most important metropolitan city, it can be deduced that this will be increased if all the national territory is covered.

References

- 100 Resilient Cities, 2017. *Human & Resilient Santiago: Resilience Strategy*. [ONLINE] Available at: http://www.100resilientcities.org/wp-content/uploads/2017/07/Santiago-Resilience-Strategy-English.pdf [Accessed 19 March 2019].
- Arriagada, R., Aldunce, P., Blanco, G., Ibarra, C., Moraga, P., Nahuelhual, L., O´Ryan, R., Urquiza, A., Gallardo, L. 2018. *Climate change governance in the anthropocene: emergence of polycentrism in Chile*. Elem Sci Anth, 6: 68.
- Bache, I., & Flinders, M., 2015. *Multi-Level Governance: Essential Readings*, Cheltenham, UK: Edward Elgar Publishing Limited. [ONLINE] Available at: https://doi.org/10.4337/9781784716240 [Accessed 20 August 2019].
- Boswell, M.R., Greve, A.I. & Seale, T.L., 2012. *Local climate action planning* / Michael R. Boswell, Adrienne I. Greve, and Tammy L. Seale; images by Dina Perkins., Washington, DC; London: Island Press.
- Bulkeley, H., 2013. *Cities and climate change*. London; New York: Routledge.
- Bulkeley, H. & Betsill, M., 2003. *Cities and climate change: urban sustainability and global environmental governance*. London; New York: Routledge.
- Bulkeley, H. & Betsill, M., 2005. *Rethinking sustainable cities: Multilevel governance and the urban politics of climate change*. Environmental Politics, 14(1), pp.42-63.
- Bulkeley, H. & Betsill, M., 2013. *Revisiting the urban politics of climate change*. Environmental Politics, 22(1), pp.136–154.
- Bulkeley, H. & Castán Broto, V., 2012. *Government by experiment? Global cities and the governing of climate change*. Transactions of the Institute of British Geographers, Royal Geographical Society (with the Institute of British Geographers)
- Bulkeley, H. & Kern, K., 2006. *Local Government and the Governing of Climate change in Germany and the UK*. Urban Studies, 43(12), pp.2237–2259.
- Carmona, M., 2016. *Explorations in urban design: an urban design research primer* / edited by Matthew Carmona.
- Cini, M. & Bourne, A.K., 2006. *Palgrave Advances in European Union Studies*. Palgrave Macmillan.
- Di Gregorio, M., Fatorelli, L., Paavola, J., Locatelli, B., Pramova, E., Ridho Nurrochmat, D., May, P., Brockhaus, M., Maya Sari, I., Dyah Kusumadewi, M. 2019. *Multi-level governance and power in climate change policy networks*. Global Environmental Change 54, 64–77.

- Fundación Terram, 2019. *Piñera y los desafíos medioambientales de la COP25*. [ONLINE] Available at: https://www.terram.cl/2019/04/pinera-y-los-desafios-medioambientales-de-la-cop25-chile-esta-entre-los-paises-lideres-del-mundo/ [Accessed 10 April 2019].
- Harris, J., Muller, S.A. & Woods, T., 2019. *Climate action in Chile: Towards multi-level governance.* [ONLINE] Available at: http://ledsgp.org/wp-content/uploads/2018/08/Chile-MLG-Institutional-Mapping-Report.pdf [Accessed 23 March 2019].
- Henríquez, C., & Burton, J., 2012. *Fortalecimiento de la gestión ambiental municipal (Chapter VIII)* on *Propuestas para Chile 2012.* Edited by Irarrázaval, I., Morandé, M. A., Letelier, M. Pontificia Universidad Católica de Chile, Santiago, Chile.
- Homsy, G.C. & Warner, M.E., 2015. *Cities and Sustainability: Polycentric Action and Multilevel Governance*. Urban Affairs Review, 51(1), pp.46–73.
- INE, 2017. *Censo 2017*. [ONLINE] Available at: http://www.censo2017.cl [Accessed 1 April 2019].
- IPCC, 2014. *Summary for Policymakers. In: Climate Change 2014: Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change.* Edited by Edenhofer, O., R. Pichs-Madruga, Y. Sokona, E. Farahani, S. Kadner, K. Seyboth, A. Adler, I. Baum, S. Brunner, P. Eickemeier, B. Kriemann, J. Savolainen, S. Schlömer, C. von Stechow, T. Zwickel and J.C. Minx. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.
- IPCC, 2018. *Summary for Policymakers. Global warming of 1.5°C.* Edited by V. Masson-Delmotte, P. Zhai, H. O. Pörtner, D. Roberts, J. Skea, P.R. Shukla, A. Pirani, W. Moufouma-Okia, C. Péan, R. Pidcock, S. Connors, J. B. R. Matthews, Y. Chen, X. Zhou, M. I. Gomis, E. Lonnoy, T. Maycock, M. Tignor, T. Waterfield. World Meteorological Organization.
- Johnson, C.A., 2018. *The Power of Cities in Global Climate Politics: Saviours, Supplicants or Agents of Change?*. London, Palgrave Macmillan UK.
- Kousky, C. & Schneider, S.H., 2003. *Global climate policy: will cities lead the way?*. Climate Policy, 3(4), pp.359–372.
- Lancaster, K., 2017. Confidentiality, anonymity and power relations in elite interviewing: Conducting qualitative policy research in a politicised domain. International Journal of Social Research Methodology, 20(1), 93-103.
- Lee, T. & Koski, C., 2015. *Multilevel governance and urban climate change mitigation*. Environment and Planning C: Government and Policy, 33(6), pp.1501–1517.
- Livert, F. & Gainza, X., 2018. *Distributive politics and spatial equity: the allocation of public investment in Chile*. Regional Studies, 52(3), pp.403–415.

- Maginn, S.M. et al., 2008. *Qualitative urban analysis: an international perspective* / edited by Paul J. Maginn, Susan M. Thompson, Matthew Tonts., Amsterdam; Oxford: Elsevier JAI.
- Makido, Dhakal & Yamagata, 2012. *Relationship between urban form and CO2 emissions: Evidence from fifty Japanese cities*. Urban Climate, 2, pp.55–67.
- Marks, G. & Hooghe, L., 1996. *European integration from the 1980s: State-centric v. multi-level governance*. Journal of Common Market Studies, 34(3), p. 341.
- Meadowcroft, James, 2010. *Climate change governance*. Background paper to the 2010 World Development Report. 4941.
- Ministerio de Medio Ambiente, 2015. *Intented Nationally Determined Contribution of Chile towards the climate Agreement of Paris*. Santiago. Ministerio de Medio Ambiente.
- Ministerio del Medio Ambiente, 2017b. *Segundo Informe del Inventario Nacional de Gases de Efecto Invernadero de Chile serie 1990-2013*. Santiago, Chile.
- Pacheco, F., Sánchez, R., Vilena, M., 2013. *Eficiencia de los Gobiernos Locales y sus Determinantes: Un análisis de Fronteras estocásticas en datos de Panel Para Municipalidades chilenas*. Dirección de Presupuestos del Ministerio de Hacienda. Santiago, Chile. *
- Peters, G.P., 2008. *From production-based to consumption-based national emission inventories*. Ecological Economics, 65(1), pp.13–23.
- REDMUNICC, 2018. *Declaración de alcaldes ante el cambio climático*. [ONLINE] Available at: https://drive.google.com/file/d/1Acdnh9qg_moBruEb_11hlzL9mPwEnsX8/view. [Accessed 25 March 2019].
- REDMUNICC, 2019. *La Red Chilena de Municipios ante el Cambio Climático*. [ONLINE] Available at: https://www.redmunicc.cl/la-red/. [Accessed 25 March 2019].
- Rydin, Y., 2007. *Indicators as a Governmental Technology? The Lessons of Community-Based Sustainability Indicator Projects*. Environment and Planning D: Society and Space, 25(4), pp.610–624.
- Rydin, Y. 2010. *Governing for sustainable urban development.* London, Earthscan.
- Scarpaci, J.L. & Irarrázaval, I., 1994. *Decentralizing a Centralized State: Local Government Finance in Chile Within the Latin American Context.* Public Budgeting & Finance, 14(4), pp.120–136.
- Turcu, C., 2013. *Re-thinking sustainability indicators: local perspectives of urban sustainability*. Journal of Environmental Planning and Management, 56(5), pp.695–719.
- Turcu, C., 2018. *Sustainable development and planning (Chapter 12)* on *Planning Practice. Critical Perspectives from the UK*. Edited by Jessica Ferm and John Tomaney. London; New York: Routledge.

- Turcu, C. 2019. *Climate change Mitigation in the Residential Sector through a well-being lens: from dwellings and homes to sustainable neighbourhoods and communities*. Organisation for Economic Co-operation and Development.
- Turcu, C. & Gillie, H., 2019. Planning for the circular economy of London: government (tools) and governance (power) in practice. Draft, paper in revision for publication.
- United Nations Environmental Programme. *Electric buses put Chile on the path to a healthier tomorrow*. [ONLINE] Available at https://www.unenvironment.org/news-and-stories/story/electric-buses-put-chile-path-healthier-tomorrow. [Accessed 17 August 2019].
- United Nations Framework Convention on Climate change. 2019. *Santiago Climate Change Conference - December 2019* [ONLINE] Available at https://unfccc.int/Santiago. [Accessed 1 April 2019].
- Valenzuela-Levi, N., 2019. *Factors influencing municipal recycling in the Global South: The Case of Chile*. Resources, Conservation and Recycling, 150 (2019) 10444.
- Vicuña, S., Bustos, E., 2017. *Cambio Climático en la Región Metropolitana de Santiago - Profundización Temática para la Estrategia de Resiliencia de Santiago*. Gobierno Metropolitano de Santiago, Santiago, Chile. *

** Texts in Spanish are included regarding the importance to include local literature and policy documents in the research.*

Annex 1: Information requested to municipalities

Using the Chilean Law number 20,285 about Access to Public Information, 52 municipalities of the SMR were individually asked to inform the following:

1. Does the municipality have a Climate change Local Plan or Strategy? Is this information public? Please attached the document in the answer.
2. Does the municipality have any strategy or action to mitigate climate change? For example, any policy or actions carried out by the municipality intending to reduce GHG emissions in municipal facilities and the commune. Is this information public? Please attached the document in the answer.
3. Does the municipality have any strategy or action to absorb carbon from the atmosphere such as reforestation, tree plantations and the creation of new green areas that act as lungs of the commune? If yes, is this information public? Please attached the document in the answer.
4. Does the municipality have any adaptation strategy or action against the effects of climate change? For example, any policy or action that reduces the vulnerability of the community on the impacts of climate change, such as heat waves, floods, droughts, etc. Is this information public? Please attached the document in the answer.
5. Does the municipality have any strategy for the sustainable development of the area contained in any official document? Is this information public? Please attached the document in the answer.
6. Does the municipality have a diagnosis about the reaction capabilities and vulnerabilities of the commune against climate change? Is this information public? Please attached the document in the answer.
7. Does the municipality have any agreement or collaborative work with any private company or NGO related to Climate change? Is this information public? Please attached the document in the answer.
8. Does the municipality have any agreement or collaborative work with any international or national network related to Climate change? Is this information public? Please attached the document in the answer.
9. Does the municipality have any internal budget or external resources to implement measures against climate change? Is this information public? Please attached the document in the answer.
10. Does the municipality have a department or team dedicated to the protection of the environment and Climate change Action?

Annex 2: Semi-structured interview to municipal public officials

Semi-structured interview based in 5 topics. The base questionnaire is the following:

1. History of the climate action in the municipality.
    a. How was born the project to developing a Local climate action Plan?
    b. Did the municipality had climate change actions before developing a Local climate action Plan?
2. Vertical and horizontal influences concerning the Local climate action Plan
    a. How is the relation with upper-level governments (including national and regional institutions)? Does de municipality have formal connections regarding climate change?
    b. How is the relationship with other municipalities and city networks? Does de municipality have formal connections regarding climate change?
    c. How is the relation to citizenship regarding the elaboration and implementation of the plan?
3. Drivers and barriers to implementing a CAP
    a. What are the main drivers and motivations to develop the Local climate action Plan?
    b. What are the main barriers to develop the Local climate action Plan?
4. Measurements and indicators
    a. Does de municipality have an inventory of the GHG emissions?
    b. Do the Local climate action Plan consider GHG emissions indicators?
    c. How the municipality measure the impact of the Local climate action Plan?
5. Planning and built environment
    a. Had participated in any department (or professional) related to the built environment or planning in the development of the Local climate action Plan? What was their role?
    b. Has the department of municipal planning or the built environment any responsibility in the management of the Local climate action Plan?
    c. Is available another document or guidance related to climate mitigation in the departments of planning or built environment?

Annex 3: Interviews Codebook for Thematic Analysis

Area	Code	Description	Int.	Selected quotations
Chilean context of local climate actions	**1A**	**Attributions and resources are centralized at the National level**	NGO LG12	*'Climate Change was tackling at a macro level, the Paris Agreement was being discussed, and the national structure and policies were beginning developing. However, there was no clarity on how to bring that to the municipalities, to the territories.' NGO.* *'There is a structural issue of how we organize as a country that is not working, with this excessive centralism. And it is well known that Climate Change needs to be approached with a decentralizing and local pint of view, to return to work on a territorial scale, with greater autonomy, with more attributions and resources.' NGO.* *'One of the barriers we face is related to this bureaucracy, with the slowness of the Chilean State to respond to our requirements (...) We are responding to emergencies and not anticipating scenarios, and Climate Change is about anticipating scenarios.' LG12.*
	1B	**Local administration versus Local governments: the municipal capacity to address Local climate action**	NGO LG10 LG12 MR	*'There is a great deal of talk about they are local administrations rather than local governments. Local governments have more attributions, capacities and resources than local administrations (...) therefore, the possibility of incidence in matters of Mitigation and Adaptation is quite little.' NGO.* *'We should be more local governments and a little fewer local administrations (...) As stated, the battlefield of climate change is at the local level, and if so, the local government should have more power and resources to face it.' LG12.* *'More than local governments, from our perspective, these are local administrations. Why? Because local governments have an interesting profile with certain powers, not only to manage a territory but also with governing them (...) Governing has more considerable powers, such as specific territorial decisions. But they usually cannot be taken if they do not go through a change in legislation or President decision. Local governments have a small margin of action, but it is too low compared to, for example, other municipalities in Latin America.' ME.*
	1C	**Governing by enabling private sector and NGOs**	NGO ME LG07 LG12	*'They [founders of the NGO] saw that there was a gap that was important to address, taking as a reference the work of other organizations that were already working in that area, such as ICLEI and other local governments networks.' NGO.* *'When the National government cannot deal with a problem, then simply from there an NGO arises, because a need arises. The whole issue of local climate institutionality, which is an issue that the government had not addressed in that way, ended up addressing by the NGO Adapt-Chile.' LG05.* *'With the private sector, it is much easier to work with security policies because it is an issue that matters to them, but environmental topics, there is no such will.' LG12.*

Drivers to implement local climate actions	**2A**	**Political will: the influence of the Mayor's vision in implementing Local climate action**	NGO LG02 LG05 LG06 LG06 LG08 LG10 LG11 ME	*'There is a political will, and if that did not exist, the truth is that it would be a hard battle to be able to advance on these issues.' LG11.* *'At the municipal level, unfortunately, it still depends on political views. Some mayors are 'ready for action', and they believe that it is relevant, and believe that it is fundamental in the territorial planning.' LG02.* *'Yes, but it is a bad thing that climate action depends on the political will. Then another mayor comes and what was above could be throw down.' ME.*
	2B	**Growing public demand for environmental policies and Local climate action**	NGO LG01 LG02 LG04 LG05 LG06 LG09 ME	*'The municipality has always wanted to be pioneers in environmental policies (…) our neighbours are interested in these issues because, Maslow's pyramid, when they have covered their basic needs for sewage, food, and Health, they begin to have other requirements, and the environment becomes essential.' LG05.* *'In a commune-like ours, with a highly vulnerable community, we have many need to cover before thinking about recycling. However, nowadays we have a network of three Recycling points, we have waste management that is progressing with a little less force, but that is working. So, our neighbours may have not too much purchasing power, but they can think about covering their needs and also worrying about the environment.' LG04.* *'I believe that today, we are at a time where citizenship is very empowered, and there are communities where beyond waste management they have other interests and are very aligned [concerning climate action]. Even so, some of them have greater capacities than professionals from the municipalities.' LG02.*
	2C	**Vulnerability to Climate Change. Problems in the territory regarding climate change as a driver**	LG07 LG08 LG12	*'We did a study where we discovered that the emergency budget increased by 50% in comparison to the previous year [relative to unexpected weather events]. When we presented this study to the directors, they triggered a sharp look because poor municipalities have to get the money out of the approved budget. Hence, that's why this issue got a lot of attention. ' LG08.* *'The main motivation is that we are a highly vulnerable commune, with very poor-quality infrastructure. So, that makes that any extreme weather event has a much greater impact on citizenship. In that sense, it is essential to have an action plan to reduce those impacts.' LG07.* *'When real estate development arrived, environmental problems begin to occur (…) And this made the municipality have to strengthen itself professionally (…), and we began to realise that this commune had a problem that was a little bigger. And so, we began to contact people who were there in Santiago studying the issue of climate change (…) through an NGO called Adapt-Chile.' LG12.*

Barriers to implement local climate actions	**3A**	**Lack of resource of local authorities to implement Local climate actions**	NGO LG02 LG03 LG04 LG05 LG06 LG07 LG08 LG09 LG11 LG13 ME	*'Budget [is our biggest barrier]. Yes, because basically, for example, the law that encourages recycling is not funded, then it transfers responsibilities to the municipality, but does not transfer resources (...) In fact, the environmental management department itself has no budget.' LG03.* *'I think that in matters of budget we really don't have any problem, this commune is one of the few communes in Chile that has no budget problems, so I believe that the economic issue does not count.' LG01* *'There are municipalities that have a budget that is more than CLP 1.000.000 per capita compared to others that have CLP 190.000 per capita. So obviously, the budget that is available to finance plans and programs and concrete actions it is very different.' LG02* *'One of the main demands we have is about resources. We managed, two years ago, to open a financing line after struggling four years. We opened a funding line with the Regional Development Fund, using the 6% of the regional budget to environmental protection and environmental education, which did not exist (...) Look, before that there was zero regional budget for environmental projects.' ME.*
	3B	**Lack of professionals and human resources inside the municipalities to create and implement Local climate action**	NGO LG01 LG02 LG03 LG04 LG05 LG06 LG07 LG10 LG11 LG13	*'Our approach is evident that what we are looking for leaving installed capacities within the municipalities, for the elaboration of the plan, its implementation and monitoring.' NGO.* *'I work with a zero budget in all my topics, and despite that, I can allocate many funds in the year because the issue of getting funding is feasible. But the issue of having people working on the Municipality is complicated.' LG01.* *'Now, the barriers for both the elaboration and the implementation of the plan are the man-hours because it competes with many other municipal initiatives.' LG06.* *'We know the disparity, not only economic that municipalities have, but also the professionals that make up their team. And in the long run, has its impact, there is a huge difference to implement the projects (...) Having a strong and trained team in the areas of environment and climate change is very important.' LG02.*
	3C	**Access to finance for Local climate actions**	NGO ME	*'In the case of the Green Climate Fund, it is already known that Chile will not receive donations, only loans. But local governments in Chile are not able to acquire loans, and there is also no interest from the Treasury of Chile that local governments acquire loans.' NGO.* *'What happens is that, unfortunately, the fact of being an OECD country is a problem. Unfortunately, international funds don't give priority to countries that are OECD. And it is super weird because I do not see that Chile is an OECD country. I think it is an OECD-transition country, so the same rule should not apply. And that inhibits the international cooperation (…) Therefore, being an OECD country has hurt us in international financing.' ME.*

Barriers to implement local climate actions	**3D**	**Lack of coordination within different Municipal departments**	NGO LG02 LG04 LG05 LG07 LG09 LG10 LG11 LG13	*'In the municipalities, there is a lot that there are great atomization and many times the department next door is not aware of what the other is doing, and they should be coordinated. They should be doing synergy, but they do the opposite.' NGO.* *'I think it is the clash with departments that are 'more powerful' within the municipality such as the Local Police Judge or the Municipal Public Works Department (...) And in this clash of influences, we are always one step further back.' LG05.* *'Of the most important, basically the internal coordination here in the municipality, which we need to strengthen because the truth is that today it is challenging to reach the rest of the units, their respective teams (...) Because obviously, we as a department alone will not be able to develop all the actions. Then there has to be a greater commitment and involvement of the staff of the rest of the directorates and departments of the municipality.' LG10.* *'So, that's like a way of working, because SCAM [Municipal Environmental Certification] forces you to have a table with all the Directors to talk about the environment (...) but the environmental committee, in practice, doesn't attend his meeting, he says 'they owe me such an indicator', they put the signature, and that's it (...) Actually, there is no transversal work.' LG13.* *'Climate Change is not discourse. It a truth, and we have to do things. And it does not only correspond to the Director of the Environment Department or Climate Change team, but it should be a transversal policy of all Departments of the Local government. That is one of the internal obstacles.' LG02.*
	3E	**Internal obstacles inside the municipalities**	LG02 LG03 LG07 LG09 ME	*'The Environmental Departments of the municipalities do not have an extensive decision-making consideration, because the development planning responsibility is in the Planning Secretariat. So, they (Environmental Departments) are seen as executors. However, the environmental issue today, especially in the context of Climate Change, it is completely strategic and is transversal to all departments.' LG07.* *'I am convinced that the problem of Climate Change cannot be hosted by the Municipal Service, which is an operational unit. Climate Change should be hosted, or be on par, with SECPLA [Planning and Programming Secretariat], because that is where the territory is planned, where changes are made to regulatory plans, where large projects are done.' LG02.* *'We are in that modification, thinking about how we do to strengthen the Environmental Departments, for not continue being just a declarative issue. But frankly, I think that in about ten years, that scenario will be different. I think it will be another duty of the municipality, and we will have a municipality not so much from the 70s or earlier, but a more updated municipality. Because the normative political design does not resist, with this voluntary approach, we will go not so far.' ME.*

Vertical influences to implement Local climate actions	**4A**	**The relation between Local governments and higher levels is on compliance with plans and programs, mainly based on financing and not in a collaborative approach**	LG01 LG03 LG06 LG07 LG08 LG10 LG13 ME	*'We develop projects, and the collaboration [with upper-level governments] arise through specific funds, but it is not an institutionalized process of working, strategic planning or things of that style.' LG01.* *'With the regional government, our main relationship is though the FNDR [which are Regional Development Funds], and from different pilot programs in which they collaborate with us because we are being piloted for different programs.' LG06.* *'We are linked more than anything with the regional government, linked mostly by applying for funding and projects.' LG03.* *'I am a little disappointed because what the Ministry of the Environment wants to do is, basically, transfer capacities on these issues to the municipalities, but that transfer is not accompanied by sufficient allocation of resources. And, therefore, in the end, it often ends up being quite exhausting for us.' LG10.*
	4B	**Certification process as a tool to progressively guide Local climate action**	LG04 LG09 LG10 LG12 ME	*'In 2010 is that the municipality adheres to the Municipal Environmental Certification. And we start at the basic level, then we go to the intermediate level, and now we signed our commitment to be a municipality of outstanding excellence in environmental matters. And one of the indicators the certification requires is working on Climate action.' LG09.* *The [Municipal work on environmental issues] started when the municipality began the SCAM [Municipal Environmental Certification] (…) There are several stages and each stage asks you for environmental analysis, incorporate energy efficiency measures, carry out the environmental policies, developed environmental ordinances and so on.' LG04.* *'Likewise, the relationship between SCAM [Municipal Environmental Certification] and the 'Comuna Energética' program [Renewable Energy & Energy Efficiency] is also being made (...) Today we are working to obtain the 'Outstanding' seal, and the certification process asks for a link with energy efficiency (...) it is a requirement to be enrol in 'Huella Chile' and calculate our carbon footprint for this higher seal. And this helps us because our Climate action is becoming stronger and will open the way to continue walking.' LG04.*
	4C	**A new regional coordination was created. However, local governments don't have relation yet.**	NGO LG02 LG03 LG07	*'Nowadays it's been worked to generate these Regional Climate Change Committees [CORECC] that eventually have to obey a regional Climate Change policy that dialogues with the national Climate Change policy, but these committees are a bit disoriented, They do not have evident indications from the national government on what to do, how to do it, how to organize and structure them, and so on. The law [Climate Change Framework Law], from what we have read and discussed, does not provide any additional guidance.' NGO.* *'The CORECCs are a significant figure, but up to date, I don't really know what they are doing, what they are working on or what they are contributing.' LG02.*

Horizontal influences to implement local climate actions	**5A**	**There is more collaboration between different municipalities belonging to REDMUNICC than regional coordination**	LG01 LG02 LG05 LG06 LG07 LG09	*'With the Chilean Network of Municipalities for Climate Change (…) we have a WhatsApp group where we can write and send documents. At least, in my own experience, the Chilean Network of Municipalities it is much more immediate and horizontal than C40.' LG05.* *'The Chilean Network of Municipalities for Climate Change has been the most effective communication platform with the rest of the municipalities. And that helped us to communicate, either through the workshops or through the WhatsApp group. We are constantly giving tips and requesting recommendations between the municipalities. Therefore, is an excellent support platform between local governments.' LG07.* *'In general, we have several opportunities where the municipalities meet and socialise experiences, where we share how to work in some matters. But there is not a binding work in those areas. Rather it is more like specific consultations (…) it is not a daily or coordinated work among the SMR municipalities.' LG06.*
	5B	**Working in partnership with Local governments networks provides external support to create and implement Local climate action.**	NGO LG01 LG05 LG06 LG08 LG12	*'Being in the Chilean Network of Municipalities for Climate Change is also good for bringing resources to the community. We know that this can help us, for example, to generate energy efficiency projects for educational establishments. Or any other project that the municipality does not have resources.' LG09.* *'The Chilean Network of Municipalities for Climate Change has helped us a lot in the gathering of information on everything to elaborate the local climate change plan, it also collaborated with professionals in the area, and there is also permanent training concerning the topics that the Chilean network finances against climate change.' LG03.* *'And, obviously, we work in coordination with Adapt-Chile and other institutions (…) It is a fairly small circle and very collaborative, not competitive, and that is extremely positive. I will never take the spaces away from Jordan [NGO Adapt-Chile]. We try to encourage them because we know it is not enough with our effort.' ME.*
	5C	**Working in partnership with local governments networks allows technical teams inside local governments to give visibility and validity their work inside and outside the municipality**	NGO LG01 LG05 LG06 LG08 LG12	*'The technical teams valued [the work with the Chilean Network of Municipalities for Climate Change] because it allowed them to order their management. Firstly, to realise everything they already did in matters of Climate Change, many times, it was invisible within the same municipalities, and secondly, to order its management.' NGO.* *'Basically, what Adapt-Chile [the NGO behind Chilean Network of Municipalities for Climate Change] came to capitalize a work that was already being done inside the municipality.' LG01.* *'The commune was already advanced in Local climate action but was missing a more formal approach' LG05.* *'We started the other way around because we already had initiatives and actions related to climate change adaptation and mitigation, but we had never put them in value in terms of Local climate action.' LG06.*

Horizontal influences to implement local climate actions	**5D**	**Collaboration between different municipalities belonging to different local level associations**	LG04 LG13	*'This municipality, in addition to belonging to the Chilean Network of Municipalities for Climate Action, also participate in the AMUR Association of Rural Municipalities and the AMUSA, Association of Municipalities for Environmental Sustainability. So, yes, through these organisations, we coordinate or work with other communes.' LG13.* *'But as for municipal association, this is what we have: 'Mapocho-La Chimba' Association, where we apply for 'Comuna Energética' program; the Chilean Network of Municipalities for Climate Action, where we do not have an active participation; and MSur, where we do have an active involvement, receiving training mainly.' LG04.*
	5E	**The Global Covenant of Mayors for Climate & Energy network (GCoM) is valuable as a validated institutional framework**	NGO LG01 LG02	*'Our incentive to coordinate initiatives such as the Global Covenant of Mayors is all these exchange and knowledge of external experiences. What is done in other countries, bringing experts, sharing information and specific technical approaches.' NGO.* *'And with the GCoM instrument, of course, I could contribute a lot there, so in that sense, we are making more progress in mitigation. It is more than anything (...) to adjust internationally.' LG01.* *'At this moment, with the Global Covenant of Mayors, profound work is being done. We are working on the measurement of impact, indicators, and so on. And a compelling action report is being made. It has a much greater depth than the Network does [the Chilean Network of Municipalities for Climate Action] (...) And our local experience has to be able to be a comparable international measurement.' LG02.*

Citizenship	**6A**	**The importance of the Community Environmental Committees**	LG01 LG02	*'The Community Environmental Committee is very active; in fact, there are neighbours that offer free studies for the municipality and organise events. This is the case that I know more closely and where I see that there is very empowered citizenship, and that is driving and encouraging the municipality to go further.' LG01.* *'In this municipality, the conversation with all the actors and with the neighbours is super important (…) The community is the best technology that exists to solve problems.' LG02.*
	6B	**Informed and educated citizens demand high-quality environmental management and Local climate actions**	LG01 LG03 LG04 LG05	*'There is a very active citizen scenario. The people here have a high-level environmental awareness. And in the end, it is not only an activist but also being committed, understanding the processes and want to improve. Then, we have that citizenship that makes it easier for us and they participate a lot.' LG01.* *'The residents of this commune, because of their professional and family profile (…) are people interested in the areas of recycling and quality of life. So, per se, the citizenship of this commune is already demanding in that sense, which makes it easy for us.' LG05.* *'Finally, the demands came first from the citizens. They anticipated the responses we were giving as a municipality in environmental matters. The citizens were demanding more work on environmental issues and climate change, and also in waste management, which is stronger here.' LG03.*
	6C	**Uninformed citizens and the educational role of the local governments**	LG10 LG11 LG12 LG13	*'They don't understand much yet. (…) They have some notion, but from the point of view of the role of the local government, there is not a strong working relationship with them.' LG10.* *'But not all people associate the issue of lack of water with climate change, I will tell you this super clear. In general, people are not very clear what climate change is.' LG13.*
	6D	**The role of local governments in creating environmental awareness of their citizens**	LG05 LG06 LG10 LG12 LG13	*'There is also a citizenship issue and the responsibility to explain to the neighbour, your very green grass, your very comfortable pool, is drying the hydrographical basin. Which is also a shocking message for the neighbour.' LG05.* *'We have an environmental education centre called 'Ecoparque' [Ecological Park], where we have daily contact with people from all over the community, from the school level to adults (…). There, you can test how people see environmental matters, have focused instances on discussing climate change and small focus groups. In general, we have close contact with the community through the 'Ecoparque' that has helped us a lot to strengthen relationships.' LG06.* *'I would say that it is an important issue [about the reduction of the carbon footprint], but especially from the awareness perspective and the creation of models to be replicated. Because in a rural commune, its contribution is much smaller, both consumers of products with a large carbon footprint, and consumers. The important thing is to raise awareness, understand that small contributions also matter and at the same time, generate experiences to share is quite relevant (…) Environmental education is essential to us.' LG12.*

Measurements and indicators	**7A**	**Measurement of GHG emission reduction inside the municipal buildings**	LG02 LG04 LG10 LG11 LG13	*'The 'Huella Chile' program supports and advises you on the measurement of the corporate carbon footprint of, in this case, the municipality (…) But, this year, I am alone, and I don't have the capacities to be able to make the measurements because it is too much work to do.' LG11.* *'I calculate every year what the greenhouse gases that we emit as a municipality. Of course, then I have been trying for more than three years to reduce the footprint, but it escapes my hands because it is super complicated. It is a super-sensitive issue because, to be honest, few people care.' LG13.* *'This year, trying to reach the 'Outstanding' seal of the SCAM [Municipal Environmental Certification], we are asked to measure the carbon footprint.' LG04.*
	7B	**Measurement of GHG emission reduction in the territory**	NGO LG01 LG05 LG06 LG08	*'Now we are going to have an exchange with the 'Argentine Network of Municipalities for Climate Change', because they prepared an inventory report and GHG reduction form that will allow the national government to consider in their NDC.' NGO.* *'That is why it is super difficult to make a territorial measurement of the carbon footprint, but we are making one at the institutional level. And as I said, unfortunately in the plans of Chile, not only ours, today we measure the success in the fulfilment of the actions and not so much as they contribute to climate change mitigation.' LG06.* *'We're going to work with carbon footprint issues. The mayor and the council decide that a team of experts will be hired to work with the carbon footprint measurement.' LG08.*
	7C	**Performance indicators**	NGO LG01 LG02 LG07 LG09 ME	*'For each measure, monitoring and compliance indicators are established. We do not ask them [Local governments] to elaborate impact indicators and even fewer mitigation measurements (...) They are using monitor indicators, not impact indicators.' NGO.* *'In terms of execution, they not give you a roadmap. But in terms of strategy, they give you an institutional framework. And it has been interesting because it is a plan that other municipal departments can use (...) it gives you an initial structure.' LG01.* *'Beyond the national projects that are the significant contributions to the NDC, the sum of all actions at local levels can contribute greatly to these national reports (…) And take into account, beyond the services that municipalities have to fulfil, what actions are worth investing because they will generate a greater impact.' LG02.* *'And that's why we are beginning to strengthen the municipalities on indicator issues. We train them to the formulation of environmental indicators and other environmental measurements in the municipalities that are in the system of environmental certification.' ME.*

Annex 4: Participant Information Sheet (Spanish)

LONDON'S GLOBAL UNIVERSITY

UCL

INFORMACIÓN PARA PARTICIPANTES

Título del estudio:
Climate Change policies in Santiago: Governance challenges turning international commitments into local practices

Políticas de Cambio Climático en Santiago: Desafíos de gobernanza para traducir acuerdos internacionales en políticas municipales.

Departmento:
The Bartlett School of Planning, University College London

Nombre y contacto del investigador:
José Ignacio Selles Ortiz – jose.ortiz.17@ucl.ac.uk / jiselles@gmail.com Celular: +44 7518609788

Nombre y contacto del supervisor:
Dr. Catalina Turcu – catalina.turcu@ucl.ac.uk

1. **Invitación**
   Usted ha sido invitado a participar en una investigación que busca examinar las políticas de cambio climático a nivel local en la Región Metropolitana, específicamente en la contribución de los municipios en la mitigación y reducción de emisiones de carbono en el contexto de las compromisos acordados a nivel de país a través del Acuerdo de París.

   Esta investigación es parte de un trabajo de disertación para el máster Sustainable Urbanism en University College London (UCL). Su participación es voluntaria, y antes de formar parte de ella, es importante que entienda el motivo de la investigación y qué involucra su participación. Por favor tómese un tiempo para leer la siguiente información y contacte al investigador en caso tenga alguna duda o algo no quede claro.

2. **Propósito del Proyecto**
   Actualmente, mientras el Gobierno está trabajando para presentar al Congreso la Ley Marco de Cambio Climático, los gobiernos locales ya se encuentran realizando acciones de cambio climático en sus territorios. Por lo tanto, un estudio sobre el panorama de la acción climática local puede darnos una idea de qué tan fuerte es la base de esa estructura que se está generando a nivel central.

   Aunque el papel de los gobiernos locales en la gobernanza del cambio climático ha estudiado en los países desarrollados, se ha prestado poca atención a esto en los países en vías de desarrollo. El objetivo específico de esta tesis es comprender el rol de los municipios en la gobernanza climática de la Región Metropolitana.

   Para ello, se entrevistará a los funcionarios públicos encargados de programas de cambio climático en los municipios que están liderando este proceso y a personeros de la Red Chilena de Municipios ante el Cambio Climático. La investigación consta de una entrevista que se realizarán a través de video llamada y la cual durará 45 minutos. En ella se le pedirá comentar algunos aspectos relacionados a la historia de las iniciativas impulsadas, las influencias en la implementación de estas acciones, las motivaciones y barreras para su desarrollo, el uso de indicadores y la relación con el entorno contruido.

University College London, Gower Street, London WC1E 6BT
Tel: +44 (0)20 7679 2000
www.ucl.ac.uk

3. **¿Por qué ha sido elegido?**
   Se le invita a participar en este estudio debido a su experiencia en la aplicación de políticas de cambio climático a nivel municipal y a su rol protagónico en el tema. Su participación es voluntaria y puede retirarse durante el proceso por cualquier razón.

4. **¿Qué pasa si desea participar?**
   Participará en una entrevista de 45 minutos, aproximadamente. También se le pedirá información básica como profesión y campo de experiencia. Se le enviará un formulario de consentimiento y este se deberá enviar firmado y dará de forma verbal antes de iniciar la primera sesión.

5. **¿Cómo se usarán los datos que provea durante la investigación?**
   Solo se grabará el audio de las entrevistas y los datos recabados se guardarán de forma anónima. Su información personal no será compartida, su nombre no será usado en ningún reporte o publicación y no será posible identificarlo a partir de sus comentarios o ideas. Asimismo, ninguna persona además del investigador manejará o tendrá acceso a los su información y los datos que provea.
   Si durante el proceso de la investigación desea retractar o eliminar alguna información, podrá hacerlo sin ningún problema ni consecuencia.

6. **¿Cuáles serán los resultados del proyecto?**
   Los resultados de la investigación serán presentados como parte de una disertación para el máster en Transport and City Planning en UCL. Puede recibir el documento final de la investigación si así lo desea. Ç

7. **Aviso de privacidad de protección de locales**
   Nota:
   El controlador de este proyecto será el University College London (UCL). El Oficial de Protección de Datos de UCL proporciona supervisión de las actividades de UCL que involucran el procesamiento de datos personales, y puede contactarse en data-protection@ucl.ac.uk

   Este aviso de privacidad "local" establece la información que se aplica a este estudio en particular. Puede encontrar más información sobre cómo UCL utiliza la información de los participantes en nuestro aviso de privacidad "general": Para los participantes en estudios de investigación, haga clic aquí

   La información que se debe proporcionar a los participantes en virtud de la legislación de protección de datos (GDPR y DPA 2018) se proporciona a través de los avisos de privacidad "locales" y "generales".

   La base legal utilizada para procesar datos personales de categorías especiales será para fines científicos o de investigación histórica o estadística.

   Sus datos personales serán procesados siempre que sean necesarios para el proyecto de investigación. Si podemos anonimizar o seudónimo de los datos personales que nos proporciona, realizaremos esto y nos esforzaremos por minimizar el procesamiento de datos personales siempre que sea posible.

   Si le preocupa cómo se procesan sus datos personales o si desea comunicarse con nosotros sobre sus derechos, comuníquese con UCL en primera instancia a través de data-protection@ucl.ac.uk.

Gracias por leer esta hoja de información y por considerar ser parte de la investigación.

Annex 5: Consent Form (Spanish)

CONSENTIMIENTO DE PARTICIPANTES

Complete este formulario después de haber leído la Hoja de información y/o escuchado una explicación sobre la investigación.

Título del estudio:
Climate Change policies in Santiago: Governance challenges turning international commitments into local practices

Políticas de Cambio Climático en Santiago: Desafíos de gobernanza para traducir acuerdos internacionales en políticas municipales.

Departmento:
The Bartlett School of Planning, University College London

Nombre y contacto del investigador:
José Ignacio Selles Ortiz – jose.ortiz.17@ucl.ac.uk / jiselles@gmail.com Celular: +44 7518609788

Nombre y contacto del supervisor:
Dr. Catalina Turcu – catalina.turcu@ucl.ac.uk

Gracias por considerar ser parte de esta investigación. La persona a cargo le explicará el proyecto antes de usted de su consentimiento. Si tiene alguna duda luego de leer la Hoja de Información o de recibir la explicación, por favor hable con el investigador antes de dar su consentimiento. Se le entregará una copia de este Formulario de consentimiento para que la conserve y la remita en cualquier momento.

Confirmo que comprendo que al marcar las casillas de abajo, consiento este elemento del estudio. Entiendo que se asumirá que las casillas sin marcar significan que NO doy mi consentimiento para esa parte del estudio. Entiendo que al no dar mi consentimiento para ningún elemento, puedo ser descartado del estudio.

		Acepto
1.	Confirmo que he leído y comprendido la Hoja de Información del estudio en mención. He tenido la oportunidad de entender la información y lo que se espera de mí. También he tenido la oportunidad de hacer preguntas que han sido respondidas satisfactoriamente.	
2.	Entiendo que podré solicitar eliminar el registro grabado de la entrevista y mis datos en un plazo de 4 semanas después de realizar la entrevista.	
3.	Doy mi consentimiento para participar en el estudio. Entiendo que mi información personal se utilizará para los fines que se me explicaron. Entiendo que, de acuerdo con la legislación de protección de datos, la "tarea pública" será la base legal para el procesamiento.	
4.	Entiendo que toda la información personal se mantendrá confidencial y que se harán todos los esfuerzos para garantizar que no pueda ser identificado(a). Solicito que mis comentarios se presenten de forma anónima, pero doy permiso para conectar mi función con mis comentarios (pero no con el título de mi posición).	
5.	Entiendo que mi información puede estar sujeta a revisión por parte de individuos responsables de la Universidad con fines de supervisión y auditoría.	

University College London, Gower Street, London WC1E 6BT
Tel: +44 (0)20 7679 2000
www.ucl.ac.uk

6.	Entiendo que mi participación es voluntaria y que soy libre de retirarme en cualquier momento sin dar una razón. Entiendo que, si decido retirarme, cualquier información personal que haya proporcionado hasta ese momento se eliminará a menos que esté de acuerdo con lo contrario.	
7.	Entiendo los riesgos potenciales de participar y el apoyo que estará disponible para mí en caso de que me angustie durante el curso de la investigación.	
8.	Entiendo los beneficios directos e indirectos de participar en el estudio.	
9.	Entiendo que los datos no se pondrán a disposición de ninguna organización comercial, pero es responsabilidad exclusiva de los investigadores que realizan este estudio.	
10.	Entiendo que no me beneficiaré financieramente de este estudio o de cualquier resultado posible que pueda resultar en el futuro.	
11.	Entiendo que recibiré una compensación por la parte del tiempo dedicado al estudio (si corresponde) o una compensación total si elijo retirarme.	
12.	Estoy de acuerdo en que otros pueden usar mis datos de investigación anonimizados para futuras investigaciones. Nadie podrá identificarlo cuando se compartan estos datos.	
13.	Entiendo que la información que he enviado se publicará como un informe y deseo recibir una copia.	
14.	Consiento que mi entrevista sea grabada en audio y entiendo que las grabaciones se destruirán dentro de las 6 semanas o se destruirán inmediatamente después de la transcripción.	
15.	Por la presente confirmo que entiendo los criterios de inclusión que se detallan en la Hoja de información y que me explicó el investigador.	
16.	Por la presente confirmo que: (a) Entiendo los criterios de exclusión que se detallan en la Hoja de información y que el investigador me los explicó; y (b) no estoy bajo los criterios de exclusión.	
17.	He informado al investigador de cualquier otra investigación en la que actualmente esté involucrado o en el que haya participado durante los últimos 12 meses.	
18.	Soy consciente de con quién debo comunicarme si deseo presentar una queja.	
19.	Acepto voluntariamente participar en este estudio.	

Si desea que se conserven sus datos de contacto para que puedan ser contactados en el futuro por investigadores de UCL que deseen invitarlo a participar en estudios de seguimiento de este proyecto, o en estudios futuros de naturaleza similar, marque la casilla cuadro apropiado a continuación.

	Sí, estaré encantado de ser contactado de esta manera.	
	No, no me gustaría ser contactado.	

Nombre del participante	Fecha	Firma
José Ignacio Selles Ortiz		
Nombre del investigador	Fecha	Firma

Gracias ser parte de la investigación.