The University Of Sheffield.

Doing things differently?
The promise and pitfalls of co-productive urban climate policy development in Greater Manchester, UK

Ryan Bellinson

A thesis submitted in partial fulfilment of the requirements for the degree of Doctor of Philosophy

The University of Sheffield
Faculty of Social Science
Department of Urban Studies & Planning

31 January 2021

Abstract

Over the last three decades, cities have become an increasingly critical arena for climate action. Meanwhile, the scientific community has reached a consensus that the climate crisis has dramatically accelerated over this same period. Despite local government organisations increasingly raising their ambitions to address the challenge, these institutions have largely struggled to determine climate policy actions that match science's urgency. To achieve the scale of action required, some local government organisations have begun to explore new policy development approaches that might determine effective climate policies by engaging the diverse perspectives from society concerned with addressing the crisis.

This research contributes enhanced understanding of one innovative policy development approach that has recently been facilitated by the Greater Manchester Combined Authority (GMCA) to produce a climate policy released in March 2019. The GMCA intended to create this climate policy using *co-production* as a policy development approach with the intention that it would foster engagement of the diverse range of perspectives from across the city-region to inclusively determine how best to accelerate climate action. The study used an embedded research approach to investigate how co-productive urban climate policy development was understood, applied and produced impact within an empirical context.

This research reached three conclusions through its analysis. First, co-productive climate policy development may be able to support new forms of enhanced public engagement, but in institutional settings, the theoretical promise of co-production should be perceived as an ambition to be aimed toward rather than attained. Second, co-productive policy development can build trust between the individuals involved in the process and strengthen policy negotiations yet ultimately produce non-transformative policy outcomes. Lastly, the procedural consequences and impacts of co-production climate policy development do not inherently support innovative climate policy actions. These conclusions highlight the immense challenges of co-productive climate policy development in local government settings, rendering the approach capable of supporting increased procedural effectiveness rather than systemic transformation.

Acknowledgements

The word “acknowledgment” does not capture the deep emotional sense of appreciation owed to those who have graciously given me their support throughout this research. Observing, thinking, reading, analysing, reflecting, and writing throughout a PhD journey can be lonely and isolating. While I have certainly experienced moments of solitude, I owe an enormous debt of thanks to so many people that have inspired me, given me energy, and encouraged me throughout this voyage.

First, thank you to my supervisors, Professor Beth Perry, Dr Aidan While, and Professor Tim May. Your constant belief in me — particularly in my moments of struggle and self-doubt — has been invaluable. Your positive encouragement, kind-hearted Yorkshire sensibilities, and endless supply of patience have been a meaningful presence throughout this PhD. Thank you for all you have taught me and enabled me to learn about myself.

Second, thank you to the Greater Manchester Combined Authority’s Environment Team and particularly Mark Atherton for creating and supporting the opportunity for my embedded research and for day-to-day support around that work. Thank you for being enthusiastic throughout this research project and always open to being asked difficult questions. I’ll finally take that cup of tea!

Third, I owe a special thanks to the Realising Just Cities programme and Mistra Urban Futures for co-funding this research. I am grateful to all those new friends involved in this programme from across the globe that have inspired me through your creative and impactful work.

Thank you to the Urban Institute and particularly Bert, Charlie, Nick, Sophie, Vicky, and Vicky, who worked on the Realising Just Cities project and brought joy to this work.

A massive thanks to Jenny and Alex, the PhD ‘Dream Team’. Thank you for your encouragement, advice and humour. If you want to go far, go together. Together we go.

I am thankful to all of those in the Greater Manchester community who have contributed knowledge, energy, insight and time to this project. Your contribution to this research has been invaluable and has taught me so much. I hope I can now be an honorary Mancunian.

Thank you to my family for teaching me how to be a life-long learner. Thank you, Mom and Dad, for always taking an interest in my work and providing a limitless supply of unconditional encouragement. Thank you, Hannah, for visiting us in Manchester and being an immense source of pride. Ashlee, thank you for your patience, indulgent conversations and embracing new horizons with me. I am forever grateful for your love and kindness. Here’s to our next adventures!

And finally, I would like to express my deep appreciation to my Bubee Harriet and Great Uncle Mark to whom this PhD is dedicated. You have been an inexhaustible source of inspiration that I can always rely on. I hope my work in this PhD and all I do afterward can rise to the standard of moral clarity, humanistic values, and unwavering commitment to others that you have always embodied.

Table of Contents:

List of Tables

Declaration

I, the author, confirm that the Thesis is my own work. I am aware of the University's Guidance on the Use of Unfair Means (*www.sheffield.ac.uk/ssid/unfair-means*). This work has not been presented for an award at this, or any other, university.

Please ensure that any publications arising from the thesis are acknowledge in this section.

1. Introduction

> "The climate change crisis is an incomprehensibly massive, terrifying and overwhelming challenge. Coming together and working alongside one another is the only way we can make a meaningful impact with the limited time we have left before our future vanishes."
>
> — Participant 2, personal communication

These sentiments expressed by an environmental educator highlight the uncomfortable truth that we likely have only a brief period to address the root causes of the climate crisis before stumbling across irreversible 'tipping-points' that could end human existence as it currently exists (Cai et al. 2015; Lemoine & Traeger 2014; van Nes et al. 2016). The dangers posed by what has been described as a 'Hothouse Earth' scenario by Steffen et al. 2018 have led many local governments around the world to discuss the urgent need to reduce their carbon dioxide emissions and adapt to dramatic climatic shifts (Chu, Anguelovski & Roberts 2017). Simultaneously, local governments are attempting to facilitate social justice and economic development initiatives that respond to the systemic conditions that have contributed to the climate crisis (Klein 2015; Long & Rice 2019). While there is a growing chorus of local governments expressing an ambition to accelerate urban climate policy action, many have argued that far too little progress has been made, policymakers have not recognised the full scale of the crisis, and that the conventional policy development approaches used by local governments to pursue climate action are not suited to address the challenge (Patterson et al. 2018; Bulkeley 2016).

Although the international level of climate politics frequently receives the most considerable degree of public attention and scrutiny, cities have increasingly become recognised as the preeminent frontline of climate crisis where policies will have the most significant impact (see Bulkeley & Betsill 2013). This has led some local governments to ratchet up their determination to take urgent action addressing climate change as urban areas face threats from sea level rise, extreme and protracted drought, more intense heatwaves, frequent flooding events, intensifying food and energy insecurity, and the introduction of new vector diseases, amongst other climate-related challenges (Bulkeley & Betsill 2013; Rosenzweig et al. 2015). As global demographic shifts continue to concentrate a larger and larger proportion of the

global population in urban areas and a growing percentage of global emissions are being produced within urban areas, cities have arguably become the most consequential political arena for addressing the climate crisis (Bulkeley & Newell 2015; Castan Broto 2017).

Over the last two decades, there has been a burgeoning literature evaluating the various dimensions of climate action through the lens of the urban scale of politics (see Long & Rice 2019; Satterthwaite 2016). While this mounting scholarship has extensively investigated a breadth of urban climate actions, natural climate science has consistently found the climate crisis to be worsening at an accelerating pace (Steffen et al. 2018; Anderson & Peters 2016). Furthermore, as urban climate governance has been progressively investigated, it has been revealed that suitable policy responses are increasingly complex to determine as it has become more clearly understood that there is need to take holistic approaches to address climate change alongside other interdependent challenges such as the widening income and inequality gap, the rise of reactionary nationalistic politics, and the privatisation of public services that cannot be decoupled from the climate crisis (Brenner, Marcuse & Mayer 2012; Long & Rice 2019). These and other intractable urban challenges, in conjunction with the accelerating potential of climate breakdown, render urban areas a critical level of politics for climate change and demand further investigation to inform present and future climate actions.

In the introduction chapter of this thesis, I will underscore the rationale for this research, present the research's aim, provide an overview of the thesis's structure, and highlight the learning and knowledge that has emerged from this research. Climate change is perhaps the most significant challenge society has ever faced and the approaches policymakers have traditionally used to address the problem over the last number of decades have failed to reduce greenhouse gas emissions to limit global temperature increases (see Sillmann et al. 2015; Bendell 2018). To further complicate the landscape, a broad spectrum of perspectives exist on how this crisis should be dealt with, making urban climate policy development a 'risky' arena of politics (see Rutland & Aylett 2008). As I will explore in-depth, this thesis interrogates the concept of co-production and evaluates how it might be used in the sphere of urban climate governance to yield urban climate policy outcomes that differ from conventional approaches. Ultimately, this chapter demonstrates the relevance and significance of this research and synthesises the structure of the thesis.

1.1 Problematising climate change policy development

Climate change has been described as a super wicked policy challenge that is entangled within every level of politics (Levin et al. 2007; Lazarus 2008). Urban climate policy developed at the local scale of governance is intertwined with and influenced by the regional, national, and international levels of governance (Kern & Alber 2009). Local government agencies and the range of individuals and organisations involved in urban climate governance must navigate the multi-scalar political context in which urban climate policy is developed. This nested landscape that encapsulates urban climate governance — termed multi-level governance — has the principal quality of reaching policy outcomes through polycentric processes where policy decisions are reached across multiple levels of governance (Kern & Alber 2009). Multi-level governance arrangements rely on collaboration facilitated through cooperation between governance actors at various vertical levels of governance to develop policy (Bache et al. 2004). This multi-level approach is distinct from hierarchical governance that conceptualises policy development as rooted within discrete levels of governance (Bache et al. 2004).

Multi-level governance is thought to influence urban climate policy as higher levels of governance provide local government organisations with policy frameworks and resources that impact local level decision-making (Kern & Alber 2009). For instance, international agreements such as the UNFCCC or Kyoto Protocol are negotiated between and signed by national governments (Gupta 2010). Once a national government ratifies an international agreement, the national authorities filter the agreement through its legislative structures and disseminate policy frameworks to lower levels of governments that implement actions supporting the determined policy objectives (Bache & Flinders 2004). For example, the United Kingdom's national government passed the 2000 Climate Change Programme in response to commitments made eight years earlier during the 1992 UN Rio Earth Summit (Demeritt & Langdon 2004). Local authorities then filtered down this national policy, encouraged to develop their own local policy targets using standardised frameworks, and were provided capacity support and resources from national government agencies to develop and implement those plans (Demeritt & Langdon 2004).

This multi-level governance terrain can provide urban government organisations with long-term targets to work towards, policy mechanisms to incorporate within their internal processes, or standardised benchmarks to consider (Bache & Flinders 2004). Furthermore, in some multi-

level governance arrangements, national or regional government authorities will provide funding mechanisms or legal frameworks that enable and constrain the potential policy levers an urban government authority can harness (Bache & Flinders 2004). In many urban climate policy development contexts, multi-level governance architectures can both limit and empower the decisions taken by an urban governance regime.

Urban climate change policy conventionally focuses on three related climate policy domains — mitigation, adaptation, and resilience — that I analyse in Chapter 2.1. Climate mitigation broadly describes efforts to reduce carbon emission and lower atmospheric carbon dioxide concentrations (Anguelovski, Chu & Carmin 2014). Climate adaptation describes actions that seek to modify, prepare, or alter a given environment in advance of climate change's anticipated local effects (Shi et al. 2016). Lastly, climate resilience represents a system's capacity to remain viable and advance in the face of temporary shocks and chronic stresses (Meerow & Stults 2016). While all three strands of climate policy are often interlinked when discussed in urban policymaking circles, they have unique drivers, barriers, and historical pathways that influence their present decision-making (Bulkeley 2013).

Climate change has actively been deliberated in policy arenas for over 40 years. One of the first policy venues that explicitly addressed climate change was the 1979 World Climate Conference organised by the World Meteorological Organisation (Gupta 2010). The 1979 World Climate Conference is most notable because it was a seminal moment in climate politics by raising the policy issue as internationally significant (Gupta 2010). Following this, there were numerous high-profile international conferences and meetings focused on climate change, such as the 1985 Villach Conference, 1989 Noordwijk Conference, and the 1992 UN Framework Convention on Climate Change or the Rio Earth Summit as it is commonly known (Gupta 2010). The types of stakeholders involved in these early period international climate negotiations were primarily prominent natural scientists and diplomats that were collectively tasked with constructing new institutions, developing national environmental ministries (particularly in wealthy countries), and developing large NGO’s (Gupta 2010). During this initial period of climate action, climate policy negotiations primarily considered the policy arena as isolated and distinct from other policy agendas (Gupta 2010).

During this early era of climate politics, international and national policymakers largely considered climate change to be a technical or expert-driven issue and consequentially

discounted many perspectives and views that emerged from the wider public (Lahsen 2016). Policymakers predominately considered contributions made by trained professional practitioners with technical knowledge over other groups' input when developing climate policy (Lahsen 2016). The scientific and specialist communities were seen to possess objective, empirically informed understandings of the key processes that drove climate change that policymakers viewed as most consequential to their work, particularly in relation to other forms of understanding held by other groups (Lahsen 2016). These experts stemmed from academia, policy and science consultancies, international nongovernmental organisations (NGOs), and policy think-tanks and helped advocate for climate change to be addressed (Lahsen 2016). These professionalised actors that were considered the leading credible voice within climate policy discourse demonstrates why policymakers have historically viewed the issue through a narrow lens. This question of whose perspectives are informed and merit engaging with has led policymakers to discount or exclude particular forms of climate knowledge (eg indigenous or experiential knowledge) in policy development and has made it difficult for policy actors to link climate change with other policy spheres (Lahsen 2016).

While the initial period of climate policy development narrowly engaged technical experts in policy discussions, the types and range of actors that have become involved in these deliberations have subsequently expanded. In international, national, and urban climate governance contexts, policymakers have slowly shifted away from utilising policy development mechanisms that limit participation to professionalised perspectives to approaches that support relatively more public inclusion and diverse engagement (Coenen 2009). For example, the 1992 UN Rio Earth Summit was a significant, high-profile policy event that orchestrated a wide debate on climate change through novel participative processes (Coenen 2009). A delegation of 172 governments participated in the Earth Summit and more than 2,400 NGO representatives (Little 1995). The Rio Earth Summit's organising body made a deliberate objective to create a policy development environment that would support diverse perspectives, engaging and prioritising participation from civil society and activist groups, not just professionals (Little 1995). This new comparatively participative, open approach used at the Rio Earth Summit allowed for new voices such as indigenous peoples, minority communities, women and environmental activists, and others to engage with policymakers in climate decision-making, creating the possibility to reach creative policy outcomes (Little 1995).

The Rio Earth Summit's decision to engage a relatively broad range of perspectives during policy deliberations may have created space for different priorities like environmental justice, social and economic equity, and intergenerational rights to gain traction and become formally recognised through policy debates (Little 1995). For example, several nonconventional policy ideals were codified in *Section 3: Strengthening the Role of Major Groups* of Agenda 21 — one of several notable formal outcomes from the Rio Earth Summit — including the recognition of indigenous people's knowledge, the need to strengthen the role of workers and trade unions in climate policy negotiations, and the importance of engaging children and youth in sustainable development processes (United Nations 1992). These new policy agendas were, in large part, able to gain legitimacy because the Rio Earth Summit supported broader public inclusion during its decision-making processes (Coenen 2009). As a more diverse set of voices could participate within the climate policy development process, there was more subject to robust scrutiny, nuanced policy debate, and ultimately untraditional outcomes were determined (Coenen 2009). Although there have been isolated policy events such as the Rio Earth Summit that have supported bottom-up inclusive policy development approaches, there has been a propensity for climate policy development mechanisms to favour professionalisation and expert-oriented engagement processes (Owens 2000; Van de Kerkhof 2006).

This preeminent emphasis on engaging expert perspectives in climate policy development processes has also been true at the urban level of climate governance. Local government organisations have typically struggled to conceptualise and articulate a defined role for citizens, civil society, and other public actors during climate policy development processes (Klenk et al. 2017). The public's ambiguous position within urban climate policy development can lead to negative consequences resulting from their amorphous relationship to other actors involved in the process and obscure abilities to impact policy development (Fischer 2017). Furthermore, in most Western legal frameworks — including the UK — there is no statutorily defined role for the public in climate policy development, rendering individual local government organisations responsible for determining how much or little they will consult the public in climate policy development (Fischer 2017). Scholarship has acknowledged that urban action on climate change likely requires some ongoing collaborative relationship between the 'citizens' and the 'state,' which adds to the need for exploring why and how the public might be involved within climate decision-making (see Castan Broto 2017; Rutland & Aylett 2008).

In recent years, some practitioners and scholars have advocated for greater inclusivity within urban climate policy development processes to deepen the linkages between 'the green agenda' with other social policy spheres. As the climate crisis has escalated, critical observers have analysed that the intersectional nature of climate change — particularly at the urban level of politics — must be addressed alongside other related policy areas (Harris, Chu & Ziervogel 2018; Long & Rice 2019). Linking climate policy with other policy arenas acts to strengthen urban climate policy while simultaneously confronting the urban challenges and processes that perpetuate the climate crisis (Harris, Chu & Ziervogel 2018; Tretter 2013). For instance, urban areas with a high propensity of poorly insulated residential buildings that waste large amounts of energy would be ill-served to develop retrofit policies that specifically confront this issue as an energy or building challenge. Instead, urban climate policies will have a higher likelihood of success in addressing challenges like retrofitting if they adopt an intersectional perspective, considering how issues such as fuel poverty, unemployment, local energy security, and public health can be simultaneity addressed together through a holistic approach (Long & Rice 2019). Developing intersectional, cross-cutting urban climate policy is likely to be supported by a policy development approach that enables a wide range of actors with diverse knowledge and experience to determine policy outcomes inclusively (Long & Rice 2019).

Although there has traditionally been a haphazard dynamic between professional policy actors, urban government authorities, and citizens during urban climate policy development processes, the need to expressly examine how urban climate policy might be developed through publicly engaging, participative approaches between local government organisations, practitioners and the public is more critical than ever. A growing segment of the public is expressing their disaffection with urban governance authorities over their weak success mobilising climate action. The global youth climate strike movement inspired by activist Greta Thunberg has rallied in unprecedented numbers in cities worldwide, demanding more decisive government action on climate change (Milman 2019). Similarly, the Extinction Rebellion direct action group has galvanised protesters around the world, demanding robust climate action and giving citizens a central role in climate policy development processes (Taylor, Gayle & Brooks 2019). Furthermore, there has been a groundswell of mobilisation from activist groups and increasing numbers of trade unions lobbying their governments to enact a Green New Deal to combat the climate crisis holistically while simultaneously addressing connected social challenges such as economic inequality, racial injustice, and environmental racism (Long & Rice 2019). As the climate crisis has deepened, there are intensifying popular movements demanding both more

ambitious climate action and for the public to have a greater voice in climate policy deliberations.

While urban policymakers have swayed between exclusively valuing technical professionals with enabling some forms of civic participation in climate policy development processes, it is not well defined by scholarship or practice what the position of citizens and the public might or should be within the specific context of urban climate governance (see Bäckstrand 2004; Agger 2010). Moreover, while many consider it necessary for citizens and the public to participate in determining meaningful local climate policies, it is not well understood what this engagement might look like (see Bäckstrand 2004; Rutland & Aylett 2008). As public pressure has grown, demanding more ambitious climate action and providing a wider set of stakeholders with different forms of expertise and knowledge a role in climate policy development processes, the public role within urban climate governance and climate policy development demand further scrutiny. There are a variety of public participation and engagement mechanisms that could be adopted during these processes that have been conceptualised in public policy scholarship and practice, but the value and limits of those different frameworks for urban climate policy are currently unclear (see Fischer 2000; Bäckstrand 2004).

1.2 Research aim

As examined above, there have been ongoing debates in research and practice that meaningful urban climate policy action — particularly in democratic European and North American contexts — is likely to be supported by strong coordination and prolonged collaboration between local government organisations and the constituencies it serves. However, it has not been well established what specific role citizens and the public should play in urban climate policy development negotiations, how public participation in these climate policy development processes might occur, and the relative value of different public engagement models. Moreover, it is uncertain what policy development mechanisms local government organisations might utilise to actively engage the public in climate decision-making and the potential benefits and limitations of different engagement pathways. As the climate crisis worsens, grassroots climate movements continue to mature, and the interconnected systemic nature of climate change becomes more understood, there is an apparent and present need to investigate novel participative urban climate policy development pathways.

Co-production is a concept that has increasingly garnered interest from some in research, practice, and civil society for its potential to enable broad public perspectives to be engaged in climate policy development and support robust public participation in policy debates — amongst other usages (Bovaird et al. 2015). The term co-production has been used widely to describe a variety of processes that aim to evaluate different forms of knowledge, legitimise different experiences and enable diverse groups of individuals to work together in new ways (Jasanoff 2004). For example, co-production has been used to illustrate non-traditional forms of scientific inquiry where a researcher and their research subject actively seek out new knowledges together through collaborative investigation (see Meadow et al. 2015, Perry & May 2015). Co-production is also a method for developing policies, services, or programmes where the 'policymakers' and the 'policy-users' work together through a process of knowledge, power, and resource sharing (see Durose & Richardson 2015; Joshi & Moore 2004). While the notion of co-production has been explored in some contexts such as healthcare services or the voluntary sector, there have been relatively few inquiries into co-production's application as an urban climate policy development approach.

There is growing interest from some local government organisations to explore how the concept of co-production might be used as a climate policy development approach. The Greater Manchester Combined Authority (GMCA) in northern England is one local government organisation that has recently gained interest in deploying co-production as a climate policy development approach. However, as GMCA and other local government organisations begin to consider how to utilise co-production in climate politics, there is limited conceptual understanding about how co-production might be used in this policy development context, what the approach may require and what it could potentially achieve. Furthermore, there is weak empirical knowledge of how a local government organisation might practically implement co-production as a climate policy development approach. As local governments such as the GMCA become more interested in pursuing co-production to facilitate climate policy development, there is a need to investigate and analyse the concept and its significance.

Given the above, this research aims to investigate how co-productive urban climate policy development is understood and applied within local government organisations, its potential to produce meaningful urban climate policy actions, and its implications for the individuals and organisations involved in the co-productive policy development process. To explore this aim,

the research investigates a recent climate policy development process that took place in Greater Manchester — the second largest city-region in the United Kingdom — as the GMCA developed and launched the 5-Year Environment Plan (5YEP) in 2019. The GMCA explicitly attempted to use co-production as a policy development approach as they produced the 5YEP.

I developed the research objectives and questions from this research aim by identifying a 'productive gap' between relevant scholarship and practice. As part of the research aim sought to investigate the conceptual theoretical framework in applied settings, undertaking activities to probe this productive gap was a significant component to linking the research aim to the objectives and to the questions. I evaluated the productive gap over a ten-month period in which I analysed a range of literature pertinent to the research aim while simultaneously embedded with the GMCA Environment Team to begin exploring how co-productive urban climate policy development could be utilised in an empirical setting (see Chapter 4.). This process of honing and eventually identifying a critical productive gap overlapping scholarship and practice enabled the research objectives and research to emerge from the research aim directly, solidifying a strong conceptual thread between these fundamental pillars of the thesis. Furthermore, the productive gap the research objectives and questions interrogate and evaluate is essential to underscore because it enables this thesis to contribute to critical theoretical discourses and policy debates (see Chapter 4).

To explore this research's aim which, as explained above, has emerged from recent developments within both theory and practice, this study has the following research objectives. As local governments have developed climate policies over the last three decades, policymakers and researchers undertaken analyses to identify potential weaknesses that have led these policies to produce outcomes that fall short of their initial ambition. This study's research aim and following objectives seek to build on these past developments so that new understandings can be developed that may offer opportunities to ameliorate some of the deficiencies of past local climate action. Furthermore, these specific research objectives enable the study to systemically probe the research aim and provide the study clear ambitions:

- To develop a framework for analysing the effectiveness of co-productive urban climate policy development;
- To understand the opportunities, challenges, consequences, and limitations of co-production as it is applied in local government policy development processes;

- To make a distinct contribution to scholarship and practice by applying and reflecting on the process of attempting to employ co-productive urban climate policy development.

1.3 Research questions

The research aim and objectives provide this these with a broad, overarching direction and purpose that is directly responds to developments within theoretical and policy discourses. The productive gap which was explored in order to identify where precisely these theoretical and policy discourses overlapped is how this study's three research questions were produced and selected. This study's research questions are an inextricable result of the research aim and objectives, providing a narrow, precise lens for analysis in which the thesis' three levels of inquiry are framed in unison:

- How is co-productive urban climate policy development understood and applied by different stakeholders involved in a co-productive policy development process?
- How might a co-productive approach support urban climate policy development and what are the limits?
- What are the consequences of co-production as an urban climate policy development approach for local government organisations and involved stakeholders in addressing the challenges and opportunities of climate action?

1.4 Dissertation structure

To investigate and analyse this research's aim, objectives and questions, the subsequent chapters of the thesis adopt the following structure:

What immediately follows this introduction is an analysis of key literatures that I use to develop a conceptual framework for understanding and evaluating the empirical data. ***Chapter 2*** evaluates the climate crisis and the urban climate policy responses that have conventionally been made in response, the influences that have shaped urban climate policy, and explores what might be needed to achieve meaningful urban climate policy action. The conceptual framework continues in ***Chapter 3***, where I examine the concept of co-production, conceptualise it as a

policy development approach, and synthesise the conceptual framework to consider the potential advantages and obstacles this approach might have in an empirical setting.

Chapter 4 examines the research approach and design that I used to investigate the empirical study. This research adopted embeddedness as an essential element within the research that allowed this thesis to investigate the research aim from a unique, in-depth perspective. As I explore in the chapter, this uniquely helps the research contribute to theory and practice.

Chapter 5 is the first of four empirical chapters that seek to examine the research questions. This chapter centrally evaluates the co-productive approach that was used to develop the 5YEP. The chapter analyses the key interests, stakeholders, challenges, and outcomes of this process.

Chapter 6 then cuts across the 5YEP's development process by analysing the procedural innovations and outcomes fostered through the co-productive policy development approach.

Next, ***Chapter 7*** analyses the expectations the GMCA Environment Team had for the co-productive policy development approach. Furthermore, the chapter evaluates how the co-productive approach supports policy contestation and debate before analysing how the co-productive policy development approach influenced the characteristics of leadership, control, and power.

The last empirical analysis chapter, ***Chapter 8***, reflects on my role in the research through embeddedness to interrogate how my actions impacted the co-productive approach. This beginnings by evaluating the specific influences I made during the 5YEP's development process, analysing what enabled me to have these particular impacts before finally evaluating the learning generated through embeddedness.

The thesis concludes in ***Chapter 9*** by drawing together the previous chapters' analysis and summarising the key empirical findings that fulfil the research aim and questions and articulates its main contributions to knowledge. Additionally, the chapter identifies the significance of this research for future scholarship and practice.

2. Urban climate governance: Unravelling the crisis & examining policy responses

As discussed in Chapter 1, this thesis seeks to examine the role of the public in urban climate politics through participative policy development approaches, namely co-production. Climate change is an enormously complex policy area that has been difficult to address effectively. Policymakers have attempted to confront climate change over the last several decades since it was first identified as a societal challenge. One persistent issue faced by policymakers trying to produce climate policy has been the lack of consensus surrounding the issues and set of policies needed to solve them. Climate change is a heavily contested policy area that is inherently selective, given the complex nature of the problem and diverse perspectives on how best to solve it. Therefore, this thesis tries to cultivate new understanding surrounding how co-production may support contestation, negotiation and determine policy outcomes between diverse interests in a politicised policy development context.

This chapter begins by exploring the climate crisis and policy actions that seek to respond to it. This section examines the three distinctive and interrelated branches of climate policy — mitigation, adaptation, and resilience — and analyses the nested multi-level political scales of governance within which climate policy is developed. Next, I analyse seven key factors that can significantly influence an urban climate policy development process identified from a synthesis of climate governance scholarships. This section also evaluates how each of these factors can enable and constrain decision-making within climate politics. Finally, the chapter concludes by analysing traditional urban climate policy development processes as missing effective mechanisms for interrogating, debating and negotiating between stakeholders' diverse perspectives surrounding different options for climate policy action. This analysis demonstrates that urban climate policy action requires policy development approaches to support contestation and deliberation between these varied viewpoints. This assessment calls for investigating co-production as a potentially significant pathway for overcoming the factors that have constrained urban climate policy action.

This chapter provides an in-depth analysis of climate policy development at the urban scale and enables the thesis to explore a critical theoretical gap that I investigate through the empirical study. Analysing the complex process of developing urban climate policy — and exploring its constraints — reveals that urban climate policy development has traditionally struggled to debate, mediate and reach policy actions that can reflect the assortment of interests

and perspectives that are held. This shortcoming has, in part, constricted climate policy action, as I analyse in the chapter. The evaluation in this chapter that leads to this understanding also offers the basis to explore co-production within urban climate policy development contexts.

The initial activity that was undertaken at the outset of this study was an exploratory and expansive review of different literatures that was then distilled, adapted and further developed into what is now the theoretical framework section of this thesis in Chapters 2 and 3. This broad literature review that was conducted during the initial ten-months of this research was, in part, conducted to give the study's initial aim coherence and support the process of making it focused around a clear set of themes which could eventually be shaped into research objectives. Importantly, this months-long process was conducted as I probed the productive gap between practice and theory while embedded with the GMCA Environment Team. Expansively reviewing various literatures while determining this precise productive gap formed the foundation of the document produced for this PhD's 'confirmation review' and set out the key areas of scholarship analysed throughout Chapters 2 and 3.

The themes probed during the preliminary expansive literature review included climate politics, urban planning, collaborative governance, participatory design, public policy analysis, local economic development and policy design. Each of these themes was explored, beginning by examing a systematic literature review of the subject area to provide a comprehensive overview followed by an analysis of individual works of research. This review process provided a comprehensive overview of each theme that was used to rearticulate and refine what would eventually become the research aim. As is frequently the case, there were many concepts and themes that I was interested in exploring at the beginning of this study. Through systematically reviewing these broad areas within the literature, while simultaneously embedding with the GMCA Environment Team, it became possible to identify which themes of literature were most directly relevant and those that were primarily tangential to the process this study would investigate.

This research began with the goal of investigating the intersections of co-production and climate policy. This intellection starting position was determined by this research's funder, the host organisation, my academic supervisor and me. However, the specific themes utilised to connect and eventually analyse co-production and climate policy could only be identified after the research activities began. The themes outlined above were identified by me and my

academic supervisor at the inception of this research using our established comprehension of co-production and climate policy. Through the initial literature review process, these seven themes were eventually segmented into two categories. The first category comprised four themes – climate politics, collaborative governance, policy design and local economic development – that were determined to be of critical relevance. These four themes were found to have direct applicability to both co-production climate policy and were also identified in practice while I was initially embedding with the GMCA Environment Team. The themes of urban planning, participatory design and public policy analysis fell into the second category as these only were determined as relevant to either co-production or climate policy and were not obviously associated with the activities being undertaken by the GMCA Environment Team. The results and insights formed during this initial literature review form the foundation of what now follows in Chapters 2 and 3.

2.1 Examining the climate crisis and policy responses

The plain reality of the climate crisis has become increasingly apparent in recent years (see Pierrehumbert 2019; Schröder & Storm 2018; Ripple et al. 2019), although it has been critically investigated for over 40-years (see Arrow et al. 1995; Scheffer et al. 2001; Wadhams & Davis 2000; Wilcox 1975). In recent years, climate science has grown more irrefutable, and the scientific community has become increasingly resolute in illustrating the intense position that the climate crisis has reached (Sillmann et al. 2015; Ryberg et al. 2016). Recent scientific events such as the release of the Intergovernmental Panel on Climate Change's (IPCC) 2018 landmark Special Report on Global Warming of 1.5 ºC have helped crystallise the unprecedented risks posed by climate change (Fischer 2017; Xu, Ramanathan & Victor 2018). Although these developments have vexed the scientific community and has led to society's passionate responses, it has become widely accepted that climate change has emerged as a present crisis and that climate policy discourse exists within an emergency-like setting (Ripple et al. 2019).

Politicians and government organisations at the local, regional, national, and international scales have developed policies to address climate change over the last several decades since the issue first emerged. One of if not the first major climate policy that gained international recognition was the United Nations Framework Convention on Climate Change (UNFCCC)

that was signed at the 1992 Rio Earth Summit (Cadman et al. 2018). Since then, climate policy has taken place through three distinct areas, each with its own historical context and challenges. These three climate policy areas — mitigation, adaptation, and resilience — have traditionally been viewed as existing within separate silos but have intrinsic connections and synergies (see Figure 1; Schrag 2007; Anguelovski, Chu & Carmin 2014; Meerow, Newell & Stults 2016).

Figure 1. Forms of Climate Policy

(Author's own, drawing on Meerow, Newell & Stults 2016; Anguelovski, Chu & Carmin 2014; Schrag 2007; Fridahl & Linnér 2016; Anderson & Peters 2016; Tyler & Moench 2012; Meerow & Stults 2016)

	Climate Mitigation	Climate Adaptation	Climate Resilience
Definition	Policies designed to reduce or capture climate change inducing gases — such as carbon dioxide and methane — to lessen the 'greenhouse effect'.	Policies aimed at preparing major infrastructure and community assets from anticipated climate threats and risks.	Policies intended to modify physical and social systems for climate stresses and shocks, making them more likely to retain functionality during and after a climate change event.
Policy Examples	• Setting carbon reduction targets • Increasing renewable energy production • Increasing accessibility of public transportation options • Developing 'Negative Emissions Technologies'	• Building storm surge protection barriers • Developing nature-based infrastructure • Developing 'Geo-Engineering' technologies	• Creating cross-government agency emergency preparedness protocols • Building networks between diverse community groups • Developing redundancy with systems

Climate mitigation refers to policy action intended to reduce or prevent greenhouse gas emissions from being emitted into the atmosphere (IPCC 2013). Recently, mitigation efforts have also increasingly centred on attempts to sequester carbon dioxide from the atmosphere through both natural and technologically engineered processes (Schrag 2007). Climate adaptation policies seek to respond to the projected local impacts of climate change by proactively preparing ahead of likely consequences to reduce risk and exposure (Anguelovski, Chu & Carmin 2014). Climate resilience is the most recent area of climate policy and is defined as "a system's ability to maintain or rapidly return to desired functions in the face of shocks or stresses, to adapt to change and to transform systems that limit current or future adaptive capacity" (Meerow, Newell & Stults 2016, 45). Mitigation, adaptation, and resilience all focus

on addressing components of climate change rather than adopting a holistic approach to solving the entire problem.

Climate mitigation is the only branch of climate policy that directly attempts to stop the acceleration of climate change by focusing on limiting or even reversing the so-called 'greenhouse effect' (Fischer & Newell 2008). It is the longest established branch of climate policy that resulted from scientific understanding that burning fossil fuels contributed to rising atmospheric carbon dioxide levels, leading to a greenhouse warming effect of the earth's climate system (Weart 2003). Policymakers across all scales of authority contextualised this knowledge of the greenhouse effect with the recognition that there was and continues to be a need to develop policies that support reducing carbon dioxide emissions (Weart 2003). At the global scale of politics, the UNFCCC was the first international treaty that created a framework for reducing emissions at a supranational level (Cadman et al. 2018). Meanwhile at the urban level, cities have been developing climate mitigation policies for over 25 years, such as with Portland, Oregon, USA that developed its first climate mitigation policy in 1993 (Slavin & Snyder 2011). Climate mitigation policies continue to be adopted today by government organisations at all levels of authority and have primarily focused on setting carbon dioxide emissions reduction targets (Hughes 2017).

Climate mitigation focuses on policy action that takes place through two pathways. First, there is the reduction and eventual elimination of fossil fuel usage. Second, the capture of atmospheric carbon dioxide already emitted using either through biological processes or technologically engineered *negative emissions technologies* (NETs). NETs have been discussed for some time but are not currently a feasible climate mitigation policy intervention at scale, and leading critiques believe NETs are years away from plausibility (see Anderson & Peters 2016; Vaughan & Gough 2016; Fuss et al. 2014). However, NETs current lack of viability has not stopped some in the political, scientific, economic, and academic communities from focusing their capacities on this branch of climate mitigation policy rather than the presently practical branch of climate mitigation policy — simply reducing carbon emissions (Gough & Vaughan 2015). While many government organisations at all levels of politics around the globe have ratified climate mitigation policies that have set future targets for eliminating their carbon dioxide emissions, only a relatively small number of areas have been able to reduce their emissions thus far (Ürge-Vorsatz et al. 2018).

Climate adaptation policy discussions began in the mid-2000s and have since become widely prevalent (Fridahl & Linnér 2016). As climate modelling projections have become increasingly accurate and detailed, government organisations, particularly at the regional and urban scale, have conceptualised specific threats and risks posed to them by climate change (Black et al. 2011). This has led to the rise of climate adaptation planning where regional and urban areas have taken policy action to ameliorate their exposure to the potential hazards of climate change to reduce their economic, social, and human risks from climate change-related exposures (Anguelovski, Chu & Carmin 2014; Shi et al. 2016). Regional and local governments rapidly developed climate adaptation policies in the wake of the 2005 Hurricane Katrina, which devastated the Gulf Coast of the United States and viscerally illustrated how vulnerable urban areas are to climate change, particularly in the absence of adequate preparation (Black et al. 2011). Climate adaptation has gained significant traction in developed countries where capital-intensive infrastructures are at considerable risk to climate change impacts (Shi et al. 2016). Many of the most vulnerable areas to climate change risks are in the Global South, and several notable funding programmes, such as the UNFCCC's Green Climate Fund, have recently been established to expand climate adaptation policy across the globe (Fridahl & Linnér 2016).

Climate adaptation typically occurs on a spectrum between more ecological 'nature-based solutions' and high-tech 'geoengineering' (Anderson & Peters 2016). Nature-based solutions are thought to be less invasive forms of climate adaptation that focus on using natural approaches to respond to climate risks (Kabisch et al. 2017). For example, nature-based solutions have included planting mangroves in low-lying tidal zones to ameliorate sea level rise, installing sustainable urban drainage systems to reduce flooding risks, and retrofitting buildings with green roofs to improve thermal performance in areas that are at risk of intensifying heatwaves (Kabisch et al. 2017). Geoengineering is a more industrialised form of climate adaptation that attempts to deliberately alter the earth's climate system to lessen the impacts of climate changes using technical interventions (Anderson & Peters 2016). One of the most widely cited examples of geoengineering is 'solar radiation management' — emitting artificial particulates into the atmosphere to reflect the sun's rays to increase the earth's albedo, which may reduce greenhouse warming effects (Sillmann et al. 2015). Although climate adoption policies have become widespread, some academics and activists have raised concerns about whether it is practically feasible to adapt to the changing climate (Sillmann et al. 2015; Bendell 2018). It is difficult to assess with any certainty whether it is possible to adapt to a planet 4 or 5^0C warmer than pre-industrial averages, the level of warming society is currently

on path toward, let alone the 2^0C target set out in the Paris Agreement. However, policymakers nevertheless have been focusing on developing climate adaptation policy actions.

The third branch of climate policy - resilience - has taken off in the last decade and has become increasingly widespread (Meerow & Stults 2016). The conceptual roots of climate resilience stems from socio-ecological resilience, which focuses on a systems' ability to maintain key functionality during a crisis while accepting it may not be possible or desirable to return to the original baseline conditions after a disaster event (Leichenko 2011; Tyler & Moench 2012). Climate resilience centres on evaluating an area's likely climate change impacts across short-term shocks such as a flood and long-term stresses such as a drought or sea-level rise to prepare for the disruptions that occur over different scales (Meerow & Stults 2016). There is, however, a debate about how the system's proactive response to climate change should be conceptualised. Some policymakers have focused on developing a system's ability to 'bounce-back' — return to the pre-disturbance event 'normal' as quickly as possible — while others have concentrated on 'bounce-forward' — using a disturbance event to facilitate systemic transformation (Meerow & Stults 2016). While some policymakers at various scales have begun developing climate resilience policies, the climate policy arena has struggled to conceptualise how the most vulnerable aspects of a system will be valued in climate resilience decision-making (Tyler & Moench 2012; Archer & Dodman 2015).

Climate resilience intends to support whole systems approaches for reorienting climate 'shocks and stresses' into opportunities to develop more robust socio-ecological networks (Meerow & Stults 2016; Béné et al. 2018). While this holistic approach to climate policy action is positive in that it views climate change responses as requiring systemic transformation, climate resilience has experienced barriers in practice. Many local government agencies that have attempted to develop climate resilience policies have been unable to pierce through those organisations' siloed architectures, limiting the transformative potential of climate resilience (Bellinson & Chu 2019). This phenomenon has led climate resilience to remain embedded in one government department rather than become integrated throughout the entire organisation's processes (Bellinson 2018; Bellinson & Chu 2019). Climate resilience has gained limited traction in some government organisations because climate change has conventionally been a policy domain compartmentalised within a singular organisational department, and bureaucratic systems have constrained the creativity needed to mobilise new ways of working (Archer & Dodman 2015; Béné et al. 2018). If governance systems are to succeed in achieving

the truly systemic transformations to which climate resilience aspires, they will need to create new pathways that can galvanise integrated support for developing climate policy actions.

From the international to urban policy development levels, these three climate policy branches share a contested, complex, and politicised history. Distinguishing climate policy into these three branches is itself a selective, political process that can be contentious (see Jennings 2011). While climate scientists have reached a general consensus on the fundamental physics of climate change, there has been a lack of agreement amongst policymakers and society on how the challenge should be addressed through policy (Bulkeley & Betsill 2013). This has led climate policy action to become perceived as 'risky politics' from the perspective of government organisations responsible for developing these policies (Rutland & Aylett 2008). For instance, this risky politics may create challenges for policymakers when particular climate policy actions struggle to gain broad support from all the stakeholders that are central to implementing them. These climate policies may demand large scale public investment, necessitate new markets and business models, require behavioural changes, or create trade-offs with other policy priorities (Rutland & Aylett 2008). This contentious landscape can lead local government organisations to perceive climate change as a risky area of politics, a critical barrier to action.

Climate policy development has also been seen as an arena of risky politics because policymakers must negotiate between what has been conventionally framed as a series of complex trade-offs and choices when determining what policies to implement. Climate policy development requires policymakers to be aware of and understand the variety of choices that may exist amongst the potential climate policy options in a particular scenario and assess which options to advance (Rutland & Aylett 2008; Okereke, Wittneben & Bowen 2012). Various stakeholders with diverse perspectives often have different attitudes about the range of climate policy options that could be applied during a particular policy development scenario (Niemeyer 2013). Each climate policy option that policymakers consider may have different social, economic, and environmental ramifications that need to be operationalised and negotiated (Jennings 2011). This negotiation process can become contentious and contested between the individuals that are involved in policy debates. However, these climate policy deliberations are crucial for policymakers to meaningfully engage with and understand the various policy options that might exist, the trade-offs between them, and how different interests and agendas might be impacted by the existing choices (Niemeyer 2013). While the inherently complicated

terrain of climate policy development may be perceived as a risky area of politics, it is essential policymakers do not shy away from its complexity.

In this contentious context, developing climate change policy is further complicated by the overlapping and interwoven political scales that can each exert different influences. For instance, the international level of politics can influence debate and set an agenda on a particular issue through treaty negotiations that lower levels of political authority will then engage with (Kern & Alber 2009). This impact from the international level of climate politics can be seen through the example of the UNFCCC that seeks to reduce global carbon emissions by requiring signatory countries to adhere to a framework for reducing their national carbon emissions (Cadman et al. 2018). Then, national government organisations establish their own policy frameworks to facilitate climate actions by allocating resources and levy penalties to encourage or penalise particular activity (Lee & Koski 2015). For instance, in the UK, the 2008 Climate Change Act set a national target for reducing greenhouse gas emissions and established specific policy mechanisms to support achieving the target (Carter 2014). The 2008 Climate Change Act is also an example of this complex multi-level climate governance system as this national-level climate policy was explicitly designed to filter international climate ambition from the UNFCCC into the UK's internal legal structures.

The urban scale of politics has also emerged as an increasingly important dimension within the complex multi-level climate governance landscape. Similar to the example of the UK's 2008 Climate Change Act that was impacted by an international level policy agenda, urban climate policy development can also be affected by influences that emanate from higher levels of governmental authority, such as the national or international (see Kern & Alber 2009; Bache et al. 2004). The particular degree of influence from higher levels of interdependent government authority varies between each urban governance context (Bulkeley & Kern 2006). For instance, when the German city of Hamburg developed its Climate Action Plan 2019, they had to align this policy with federal government priorities adopted in the 2011 Adaptation to receive support from national and regional government organisations for implementing their urban climate policy (Carter 2014). Conversely, the novel wave of recent local government 'climate emergency declarations' was primarily instigated by local pressure, and higher levels of government have subsequently responded to this local action (Davidson et al. 2020). Local governments traverse and negotiate this multi-level governance landscape when developing

urban climate policy, both taking direction from higher levels of governance and compelling higher levels of governance to respond to local actions.

The urban, as described within the nested multi-level climate governance framework, has specific physical, social, and political dimensions. The words urban, city, and metropolitan are used loosely to describe a range of physical built areas ranging from isolated villages to connected industrial regions to vast megalopolises (Lefebvre 2003). Urban areas are physical sites where the 'natural environment' has been replaced by a cruder 'built environment' constructed by humans (Swyngedouw & Heynen 2003). Capital, people, and culture agglomerate in urban areas and form tangled interdependencies that change over time (Lefebvre 2003). Urban areas account for over 70% of global carbon emissions and consume an enormous amount of natural resources from surrounding rural areas and global supply chains (Creutzig et al. 2015). The urban scale of politics has become increasingly consequential within the multi-level framework of climate governance due to its share of global emissions coupled with increasing economic productivity, growing political significance, expanding share of the global population, and potential to facilitate policy action through physical infrastructures and social systems (Bulkeley & Betsill 2013). As the urban scale has grown in its significance within the climate governance landscape, it has become more critical than ever to evaluate the complexities and challenges of facilitating action through urban climate policy development.

Climate change is an immensely complicated, controversial and consequential policy arena for government organisations at all scales of politics. As the climate science community has grown ever more unified in signally the need for urgent and bold policy responses, government organisations from the international to urban levels have struggled to develop meaningful policy actions. The complex multi-level governance landscape is difficult to traverse during climate policy development at all scales. Robust forms of negotiation are required between the broad range of perspectives from the stakeholders and policymakers involved in climate policy development, and climate change remains an area of 'risky politics.' Furthermore, ongoing global trends have made the urban dimension of politics increasingly significant within the sphere of climate governance. As the challenges encompassing the climate crisis becomes more dire and the need for urban climate policy action grows, increasing scrutiny is demanded to determine what is required to facilitate meaningful urban climate action. Therefore, I will now analyse how climate policy is developed, particularly at the urban level of decision-making.

2.2 Key factors that influence urban climate policy development

My analysis of the urban climate governance literature has identified seven distinct factors that can have constraining and enabling influences during an urban climate policy development process. This section will evaluate these seven key factors that can serve as drivers and obstacles throughout these processes (see Figure 2). As analysed above, facilitating a climate policy development process is an extremely complex endeavour that requires negotiation between competing priorities, interests and perspectives. These seven factors identified from the urban climate governance literature suggest how local government organisations and the involved stakeholders navigate policy decision-making within this complicated field. While none of the seven factors entirely determine an urban policy development process's outcome, they can be used to analyse how discourses emerge, are negotiated, and eventually decided upon throughout an urban climate policy development process. By evaluating these seven factors, this section of the chapter also identifies the deficiencies or weaknesses of these factors that could support the development of novel climate policy outcomes if approached in new ways.

The first key factor that influences urban climate policy development processes is the dominant economic framework. By this, I refer to the economic worldview and priorities held by the individuals involved in the policy development process (Anderson & M'Gonigle 2012). The particular economic frameworks that politicians, policy officers, technical consultants, researchers, and other stakeholders adopt can set boundaries around what urban climate policy options or possibilities are considered economically viable, practical, and feasible (Anderson & M'Gonigle 2012). The economic worldview also influences how policymakers conceive the funding sources and spending options for potential urban climate policies (Anderson & M'Gonigle 2012). All three branches of urban climate policy are influenced and impacted by the economic worldview of the policymakers and stakeholders involved in policy development processes.

Historically, the predominant economic worldview held by policymakers and individuals involved in these processes is neoclassical economics or 'growth economics' as it's colloquially known (Raworth 2017). Neoclassical economics has been the leading conventional economic

framework dominant within policy development spheres for the past century, with its intellectual roots grounded in the industrial revolution (Fankhauser & Tol 2005). The neoclassical economic framework has been coined growth economics, in part, because it is based on the pretext that individuals make decisions to maximally benefit them personally, and organisations take actions that seek to maximise their organisational profit (Fankhauser & Tol 2005). There are two additional assumptions made within the neoclassical economic framework that are particularly critical for urban climate policy development. First, that resources are unlimited, and second, infinitely increasing consumptive behaviour is economically beneficial (Daly 1992; Raworth 2017). These assumptions made within the neoclassical economic framework explain why certain climate policy discourses have gained traction and others have struggled to manifest. For example, climate mitigation policies that promote NETs allow for unimpeded consumptive economic behaviours while reducing carbon emissions challenges the notion that individuals and organisations can consume goods and use fossil fuels unabated (Raworth 2017).

Urban government political leaders, elite private sector interests, and other individuals and organisations in powerful positions have a vested interest in maintaining the neoclassical economic framework. If those with policymaking power and influence were to acknowledge the negative ramifications the neoclassical economic framework has for climate change, those individuals and interests would be compelled to seek out and adopt a different economic worldview and potentially relinquish or lose their status in that alternative economic framework (Fankhauser & Tol 2005). Additionally, accepting that the economic growth framework is, in part, what has led to climate change and accelerated the issue would make powerful interests partially culpable for climate change (Raworth 2017). Despite the overwhelming dominance of neoclassical economics, alternative urban economic frameworks have been proposed, debated, and adopted in some rare instances (see Daly & Townsend 1992; Raworth 2017; Guinan & O'Neill 2019).

Figure 2. Factors that impact and influence urban climate policy development

(Author's own, drawing on McAdam 2017; Rice, Burke & Heynen 2015; Rickards, Wiseman & Kashima 2014; Anderson & M'Gonigle 2012; O'Brien & Wolf 2010; Bulkeley et al. 2009; Sørensen & Torfing 2003; Castan Broto 2017; Lee et al. 2015; Bulkeley & Betsill 2013)

Key Factor	**Description**
Economic framework	The economic paradigm and philosophy that local governments adhere to and their corresponding set of monitored indicators.
Public Pressure & Advocacy	The spontaneous and organised activity of citizens and community groups in support or defiance of particular sets of policy issues.
Urban Governance Capacity	The resources, capabilities, intelligence and networks of a local government organisation and its key partners to develop policy and oversee its implementation.
Political Will & Leadership	The goodwill, support, community influence and relationships political elites accumulate and distribute on particular policy issues.
Local Government Organisational Culture & Norms	The priorities, values and practices of a local government organisation set by elected officials and senior administrators, and represented through the actions of policy officers.
Perceived Vulnerability to Climate Risks	An area's known exposure to potential climate change impacts and the awareness of those potential impacts.
Accessible Knowledge Base	The multiple forms of knowledge assets that are mobilised toward a specific purpose.

Public advocacy and pressure is the second factor that influences climate policy development. Climate change is historically a highly politicised policy area that causes politicians to be susceptible to public influence (O'brien, Selboe & Hayward 2018). Public advocacy and pressure specifically refer to influence from citizens, activists, campaigners, and others openly expressing their non-elite viewpoints related to climate action (O'brien, Selboe & Hayward 2018). Public advocacy and pressure is a dynamic influencing factor that can change in nature and effect over relatively short periods (McAdam 2017). There are a wide variety of methods that the public may seek to impact an urban climate policy development process, from providing forms of evidence to policymakers, to lobbying politicians on specific issues, to building public support networks, to directly protesting particular policy positions (O'brien, Selboe & Hayward 2018). Public advocacy and pressure is a factor that can be used to influence all three branches of urban climate policy.

Politicians and policymakers tend to focus their efforts on what they perceive to be urgent, immediate challenges that can lead them to avert attention away from long-term, slowly

moving issues (McAdam 2017). For more than 40 years, local government political leaders and policymakers have conceptualised climate change through the lens of a 'future' challenge (McAdam 2017). In part, this has led many politicians and policymakers to focus their efforts on what they perceive as immediate policy issues at the detriment of less pressing policy challenges such as climate change. Public advocacy and pressure is an influential factor that can compel those with positions of authority to focus their attention on what could be ignored as less-immediate policy challenges and reframe climate change as a present issue (O'brien, Selboe & Hayward 2018). The degree of influence and impact public advocacy and pressure can have varied across contexts.

Urban governance capacity is the third factor that influences urban climate policy development. This factor describes a group of individuals and organisations' relative ability in an urban governance regime to mobilise action within and across organisations toward specific objectives (Bulkeley et al. 2009). Typically, the convening institution in an urban governance regime is a local government organisation (Healey 1998). The particular personnel and resources a local government organisation contributes to an urban governance system's capacity are affected by various factors such as the degree of internal departmental siloing, level of cross-sectoral integration, and available internal resources that can be adaptively marshalled (Healey 1998). If a local government organisation is highly fragmented, the organisation will likely have more limited internal capacity it can contribute toward the overall urban governance capacity because only one or a few departments within the entire organisation will be able to support climate policy development. Alternatively, local government organisations that are highly integrated and can flexibly support cross-departmental problem solving can contribute greater internal capacity to the total urban governance capacity. While a local government organisation is not the only contributing organisation to an area's urban governance capacity, it can use its central position to attract other organisations to contribute toward the overall urban governance capacity.

A broad range of organisations and stakeholders contribute resources and capabilities to the overall urban governance capacity during an urban climate policy development process. For example, campaigners, academic institutions, practitioners, consultants, the voluntary and civil sector, and private sector organisations can contribute to urban governance capacity (Bulkeley et al. 2009). Local government organisations can convene external organisations and stakeholders into urban governance regimes (Coaffee & Healey 2003). Whether or not these

organisations and stakeholders contribute toward an area's urban governance capacity is partially determined by their relationship with the convening local government organisation that lies at the centre of the urban governance regime (Coaffee & Healey 2003). The amount and types of urban governance capacity that can impact an urban climate policy development process is shaped by the engagement and support of external organisations and stakeholders.

Urban climate policy development processes with high levels of governance capacity benefit from the personnel, resource, and network contributions made by various organisations and stakeholders that collectively support deliberation, contestation and decision making (Castan Broto 2017). This can make an urban climate policy development process more resilient over time and may support robust policy debate that can moderate between the different perspectives that might exist and improve policy outcomes (Castan Broto 2017). Conversely, urban governance regimes that have weak levels of governance capacity are poorly positioned to address the complex dynamics inherent with climate politics. Urban governance capacity is a factor that can enable or constrain critical activities during these processes, such as integrating broad knowledge bases, navigating contentious politics, bridging diverse expertise and skillsets, negotiating between varied perspectives and building consensus across networks (Castan Broto 2017).

Political will and leadership is the fourth factor that influences urban climate policy development. Politicians are typically not active in the day-to-day activities involved in policy decision-making but have a significant leadership role that can help advance or stifle progress (Bulkeley & Betsill 2013). Elected local politicians possess varying amounts of political capital — the resources and power politicians, political parties, and even some executive leaders hold that is cultivated through trust-building, maintaining relationships and networks, generating goodwill, and community influence (Sørensen & Torfing 2003). Politicians 'spend' their political capital to address issues they see as important (Sørensen & Torfing 2003). Politicians typically hold their maximum level of political capital immediately after winning elections, and their political capital decreases during their term in office as it gets spent (Sørensen & Torfing 2003). Political will and leadership influence how politicians choose to spend their political capital and the amount of political risk they are willing to assume on a given issue.

Some politicians have a particular agenda or set of issues that are personally important to them. These small number of policy areas are typically the challenges politicians are most willing to

show leadership on, invest their political capital, and take political risk to influence (Sørensen & Torfing 2003). Political will and leadership are factors that can overcome bureaucratic barriers, surmount administrative gridlock, and effectively negotiate tension or conflict between stakeholders (Sørensen & Torfing 2003). Political will and leadership are a significant factor during urban climate policy development processes that can be used to break through obstructed policy agendas, bring diffuse networks together, mediate between contentious decision-making scenarios and build support for policy options (Bulkeley & Betsill 2013). Some policymakers have viewed urban climate policy as a 'nice to have' policy area, lending political will and leadership important for prioritising the issue for local government organisations (Bulkeley & Betsill 2013).

The next factor that influences urban climate policy development is local government organisational culture and norms. Local government organisations have cultures that inform the bureaucratic norms of policy officers involved in the technocratic processes surrounding climate politics (Rickards, Wiseman & Kashima 2014). Individual policy officers and administrators engaged in urban climate policy development represent the local government organisation's culture and philosophy through their policymaking activities (Rickards, Wiseman & Kashima 2014). Local government policy officers frequently have some autonomy to make independent decisions during the climate policy development process, giving them power and agency with their positions (Rickards, Wiseman & Kashima 2014). However, the culture and norms of the organisations policy officers work in can subtly — and sometimes explicitly — shape their thinking and action (Rickards, Wiseman & Kashima 2014). Local government organisational culture is set by the priorities of senior-elected officials and executive administrators (Okereke, Wittneben & Bowen 2012). The policy officers that conduct the work associated with policymaking internalise these priorities through the performance indicators they are evaluated against, the work programmes they are most frequently asked about, and the projects that are most celebrated by organisational leadership (Peters & Peters 2002). The particular organisational culture and norms of a local government organisation can have a consequential influence on the actions of policy officers.

Organisational culture and norms can have a significant influence on the policy officers facilitating climate policy development. For example, local government organisations led by elected officials and senior administrators who prioritise short-term objectives are likely to develop cultures that limit policy officers' ability to focus on long-term policy challenges like

climate change (Rickards, Wiseman & Kashima 2014). Policy officers engaged in climate decision-making within organisations that have a culture which prioritises short-term challenges are unlikely to advocate for policy actions that may diminish from immediate objectives, even if, in the long run, those decisions would support advantageous policy outcomes (Okereke, Wittneben & Bowen 2012). Meanwhile, local government organisations with cultures that prioritise long-term objectives can enable policy officers to engage in policy development activities such as building new relationships with external organisations or patiently negotiating between competing policy perspectives that may be discouraged in other organisational cultural settings (Okereke, Wittneben & Bowen 2012).

An area's perceived vulnerability to climate risks is the sixth factor influencing urban climate policy development. Individuals in a given urban area perceive their local climate vulnerabilities and risks differently. This factor refers to the perceptions local politicians, policymakers, and key stakeholders that are involved in climate politics have of their area's particular acute climate vulnerabilities. An individual's perceptions of local climate vulnerability and risk are based on various factors, including educational attainment and subject area, socioeconomic status, age, media access, consumption patterns, religious beliefs, and past exposures to extreme climatic events (Lee et al. 2015). The combination of these characteristics fluctuates over time, which can potentially lead an individual to perceive their urban area's vulnerability to climate risk differently (Lee et al. 2015).

An urban area's total degree of perceived vulnerability to climate risks can be conceptualised as the combination of the individual perceptions of all the stakeholders involved in the process amalgamated collectively . For example, in contexts where the stakeholders driving the process perceive their local area to be at significant, acute vulnerability to climate change, there is a greater likelihood of advocacy for robust policy action having an enabling influence (O'Brien & Wolf 2010). Alternatively, the stakeholders leading a given decision-making process who consider their local vulnerability to climate risks as distant, uncertain, or minimal are likely to approach potential policy actions with less urgency and ambition (O'Brien & Wolf 2010). Stakeholders engaged in an urban climate policy development process will attempt to leverage more capacity and resources into the policy development process if they perceive their local area as highly vulnerable to climate risks (O'Brien & Wolf 2010).

The seventh factor that can influence urban climate policy development is the accessible knowledge base. The accessible knowledge base refers to the different forms of knowledge that policymakers and stakeholders involved in policy development can access to inform policymaking decisions (see Chapter 3.3, forms of knowledge). The forms of knowledge included in the accessible knowledge base can include that which is held by a range of individuals and institutions such as policymakers, stakeholders involved in the policy development process, local academic and research organisations, activists, consultants and private firms, citizens, and community groups (Rice, Burke & Heynen 2015). In addition to the knowledge held by discrete individuals and institutions, the accessible knowledge base can include knowledge links that are contributed through external networks (Rice, Burke & Heynen 2015). The accessible knowledge base is often not fully utilised because the stakeholders involved in the process only view certain forms of knowledge as legitimate or lack the capacity to incorporate particular knowledge bases (Rice, Burke & Heynen 2015).

Climate change is a highly complex issue to understand and navigate, making it a daunting policy arena to approach. Mitigation, adaptation, and resilience climate policies share some overlapping similarities and have some areas of distinction that may require policymakers to utilise specific knowledge bases depending on the focus of the climate policy (Rice, Burke & Heynen 2015). For individuals involved in an urban climate policy development process to secure and effectively access a broad base of knowledge, they must first understand that multiple forms of knowledge inform policy development (see Chapter 3.3). Furthermore, those involved in the policy development process must possess the skills and capacities to manage and evaluate diverse forms of knowledge (Rice, Burke & Heynen 2015). Policymakers and individuals involved in urban climate policy development need to embody these two traits to effectively tap into a large segment of their accessible knowledge base.

These seven factors evaluated above are each potentially influential during an urban climate policy development process. Each factor can impact urban climate mitigation, adaptation, and resilience policy development as an enabling and constraining influence. By synthesising these seven factors, it is possible to evaluate how particular agendas, interests, priorities, and voices make discrete impacts. Following this analysis, I will evaluate what features have conventionally been absent from local climate policy decision-making processes and constrained action. Assessing what characteristics may be missing from traditional urban

climate policy development that has constrained the factors evaluated above will enable me to identify what novel innovations are needed to determine meaningful climate policy actions.

2.3 Taking urban climate change actions forward

This chapter began by analysing what climate change is, the dimensions of what climate policy action has been and why it has been challenging to develop effective policy responses. I then applied these understandings to urban climate governance literature and evaluated seven influential factors that can enable and constrain urban climate policy development processes. To conclude this chapter, I examine what qualities have been absent from traditional urban climate policy development processes that novel approaches could adopt for achieving more meaningful policy outcomes. As I explored earlier in this chapter, there are diverse perspectives about how climate change should be addressed through policy. This section finds that conventional policy pathways have been ineffective at determining policy outcomes by negotiating between the various positions that exist. Analysis from this section calls for novel approaches that can better support reaching climate policy outcomes through robust contestation and deliberation that I will then evaluate in the empirical section of this thesis.

The scale and dimension of what would constitute meaningful urban climate policy is critical to contemplate when evaluating what has been conventionally been absent. The 2015 Paris Agreement is broadly viewed as the global community's collective ambition for climate action (Morgan 2016). The long-term goal of the Paris Agreement is to restrict global greenhouse gas emissions — of which carbon dioxide is the most prevalent — to a level that will keep the rise in global temperature well below 2 °C above pre-industrial levels with the aim to limit the temperature increase to 1.5 °C (Satterthwaite 2016). To achieve that ambition demands massive policy action in cities, far more significant than the mitigation efforts that have been achieved to date (see Sillmann et al. 2015). Additionally, recent high profile scientific reports such as the IPCC's Special Report on Global Warming of 1.5 ºC or the article "Trajectories of the Earth System in the Anthropocene" on climate tipping points in the journal *Proceedings of the National Academy of Sciences* demonstrate the need for increased mobilisation for urban climate adaptation and resilience initiatives. These scientific findings in combination with recent catastrophic climate-related disasters such as 2019 Cyclone Idai that devastated large swaths of Southern Africa and the most destructive ever recorded 2020 Australian bushfire

season, has also led to new debates about whether climate adaptation and resilience policy is even possible to stave off the worst-case climate impacts (see Moser 2020). Given the current trajectory of the challenges that surround climate change, it appears that conventional urban climate policy development approaches have not yielded adequate results.

Conventional urban climate policy development methodologies have been scrutinised as overly reliant on technocratic approaches that constrict contestation, deliberation and negotiation between different perspectives (see Owens 2000; Van de Kerkhof 2006). The climate policy development approaches traditionally utilised by local government policymakers have centred the voices and perspectives of a narrow set of specialists and experts and diminished views from non-professional stakeholders (Owens 2000; Van de Kerkhof 2006). Traditionally, climate policy deliberations have taken place between the professionals who are actively engaged in decision-making, in effect limiting the potential scope of policy debate by excluding particular views from the discussion (Klenk et al. 2017). In many urban climate policy development processes, the primary route for non-professional perspectives to seep into policy debates are through isolated public comment activities or consultation processes (Rutland & Aylett 2008). These forms of contestation typically do not facilitate effective climate policy debate, situating policymakers and the professionals included in the climate policy development process to justify and defend the policy prescription they have developed (Fischer 2017). While they may support limited forms of debate between small groups of stakeholders, conventional approaches to strategic climate decision-making have not meaningfully enabled widespread policy deliberation across the spectrum of policy perspectives that may exist.

If these processes were to support inclusive forms of policy debate between diverse perspectives, the seven factors that enable and constrain urban climate policy development would potentially be affected, creating the possibility for new climate policy outcomes to be determined. One example of how the inclusion of broader perspectives could potentially impact urban climate policy development comes from the city of Amsterdam's recent adoption of the "doughnut economic model" (Raworth, 2020). Most urban government organisations adhere to a neoclassical or growth economics framework during climate policy decision-making. In April 2020, Amsterdam formally adopted the doughnut economic framework expressly with the intention that the model would support the city's climate ambitions and help improve residents' quality of life (Raworth, 2020; City of Amsterdam, 2020). By adopting this economic

framework and creating opportunities for a broad range of non-traditional perspectives to engage in policy deliberates, there are expanded opportunities for Amsterdam to develop unconventional climate policy measures.

Conventional technocratic urban climate policy development approaches constrain the potential array of perspectives that could engage in deliberative climate policy development processes. This restricts the potential policy debate that could take place, limiting the range of views exerted through the seven factors that influence climate policy development. Traditional professionalised and technocratic approaches that do not determine policy outcomes between the full range of perspectives have, to date, been unable to achieve meaningful urban climate policy action. As I have examined, if a more diverse range of perspectives were to be include and contested during these processes, there would be a potential to reach novel policy outcomes. Therefore, there is need to examine and evaluate potential urban climate policy development approaches that can appropriately support engagement from the diverse perspectives on climate policy that exist from a wide variety of stakeholders through a process of ongoing deliberation.

This chapter began by evaluating nuanced components of climate change and policy responses to this complex challenge. During this initial analysis, I examined the multi-level governance framework climate policy is developed within and identified the urban dimension of politics as a critical arena for climate policy action. I then analysed urban climate governance literature to synthesise seven enabling and containing factors the influence urban climate policy development. Finally, this has enabled me to explore the limited scope of perspectives that conventionally participate in urban climate policy debate as a constraint to the critical policy contestation needed to produce robust climate policy outcomes. The analysis throughout this chapter leads to the awareness that novel approaches that can support and facilitate deliberation between diverse perspectives may be needed to achieve effective climate policy action. Given this understanding, I will evaluate co-production in Chapter 3 to assess how this concept may offer the possibility to obtain this missing feature within urban climate policy development that could help generate new policy outcomes.

3. Co-production & co-productive policy development: Theory into practice

At the beginning of this thesis, climate change was categorised as a super wicked policy challenged that can be characterised by four overarching features — those who cause the problem also attempt to create the solution; the central authority (i.e. central government) that could address the issue is currently weak in most contexts; time is running out for transformational action; and hyperbolic downplaying of the issue occurs which pushes responses irrationally into the future (see Levin et al. 2007; Lazarus 2008). Conversely, there is now growing political interest and public pressure for action on climate change, though there are significant challenges and uncertainties to facilitating the level of public and citizen engagement who will be required to support systemic change.

The super wicked, complex nature of climate change has thus far led to unsuccessful policy measures that have attempted to respond and ameliorate the crisis (Ürge-Vorsatz et al. 2018; Ripple et al. 2019; Pierrehumbert 2019). In Chapter 2, I evaluated the key dimensions of climate change and the different forms of policy responses taken at various levels of political authority, prompting particular analysis on the urban scale of climate policy. I then synthesised seven influential factors that enable and constrain local climate politics decision-making from the urban climate governance literature and evaluated the lack of robust contestation and debate between the broad range of perspectives from throughout society as a critical gap that potentially limits urban climate policy development. Emerging from this critical gap, the following chapter will explore the concept of co-production and conceptualise its potential bearing for addressing the weaknesses of the conventional approaches that were evaluated in Chapter 2.

This chapter opens by examining the concept of co-production that originated during the 1970s as a response to the New Public Management (NPM) movement in public administration that sought to professionalise and consolidate public bureaucracies. The governance and policymaking culture that co-production was conceived as a response to is similar to the technocratic policy development approaches traditionally used to address climate change. This section of the chapter examines the theoretical potential of co-production and explores the claims made about it in scholarship. Next, the chapter investigates how co-production has been applied in practice and its key challenges. This section notes co-production's documented usage in the Third Sector and healthcare, amongst other areas, but finds co-production has not

been widely applied within the sphere of urban policy development or climate change. The chapter closes by synthesising a model that demonstrates how a co-productive approach might impact the seven enabling and constraining factors that influence urban climate policy analysed in Chapter 2 differently from conventional mechanisms. This model demonstrates that a co-productive approach to climate politics might be able to achieve novel policy outcomes determined by a process of rigorous policy deliberation amongst a diverse group of perspectives on climate change from different types of stakeholders.

This chapter's analysis determines the concept may be an appropriate and effective response to the weaknesses of conventional urban climate policy development approaches that were evaluated in Chapter 2. However, the analysis of co-production also reveals the concept has several notable challenges in practical settings, including the need for significant time and capacity requirements, inexact and complicated decision-making processes, a lack of central leadership, and unequal resource demands, amongst others. Furthermore, co-production has been applied in relatively limited settings, leaving uncertainty about how it might be facilitated in an urban climate policy development scenario. Nonetheless, the analysis of co-production throughout Chapter 3 demonstrates it may offer promise and potential to rectify the gaps evaluated within conventional climate decision-making approaches. The conceptual model of co-productive urban climate policy development synthesised in this chapter — and the theoretical analysis that preceded it — calls for this novel approach to be empirically investigated to analyse its opportunities, challenges and consequences. By synthesising this theoretical model, the result of Chapters 2 and 3 respond to one of the study's key objectives and provides the distinctive opportunity to test and analyse that model in the later empirical sections of the thesis, setting up a further opportunity to fulfil another objective of the study.

3.1 Co-production and its key principles

Co-production has become a term applied widely across different research and practical disciplines in recent years. The concept, as it is used contemporarily, is grounded on a 40-year history dating back to the 1970s. Initially, co-production was an idea that stemmed from the work of political economist Elinor Ostrom and her colleagues as they assessed how governance systems and government agencies were reforming under fiscal austerity and political pressures while simultaneously attempting to maintain the delivery of their core services (Ostrom et al.

1978; Parks et al. 1981). During this early period, co-production was primarily applied in practical settings to describe 'client' or citizens participation during the process of producing the public services those individuals used (Brandsen & Pestoff 2006). As the resources, capacity and role of government organisations have continued to shift since Ostrom and her colleagues initially developed the concept, co-production and its applications have evolved. Co-production is still applied in practical and policy delivery contexts, but it also has gained traction in some political and governance settings (Flinders, Wood, Cunningham 2016). For the remainder of this section, I will evaluate these theoretical developments surrounding co-production and analyse the claims that have been made about it.

Co-production was theoretically developed and emerged during an era of sweeping reforms in many governance systems across all levels of political authority (see Hood 1995). During the 1970s and 1980s, public sector bureaucracies became increasingly professionalised and technocratic. Some functions within the public sector began a slow process of privatisation, and political and administrative leaders pushed to centralise government agencies with the intention to create increasingly efficient bureaucracies (Hood 1995; Gregory 2017). Many public policy professionals and scholars supported these "Reaganism" and "Thatcherite" reforms by developing the concept of NPM (Hood 1995). In the framework of NPM, citizens are conceptualised as passive users of policy that can be separated from the development of policy because they are seen to lack the technical skills, knowledge, experience and training necessary for policy development (Hood 1995). Conventional urban climate policy development approaches adopted NPM's framework that technocratically professionalises bureaucratic processes to narrowly centralise authority with practitioners and limit meaningful pathways for public participation (see Owens 2000; Van de Kerkhof 2006). This weakness that I analysed within conventional processes - the lack of engagement and contestation between policymakers and wider existing perspectives across society - was what Ostrom and her colleagues sought to respond to within NPM when developing co-production.

While mainstream public administration scholars developed and analysed the concept of NPM, Ostrom and her colleagues explored a heterodox model of policy delivery that centred on the active involvement of the public (Ostrom et al. 1978; Parks et al. 1981; Ostrom 1979). Co-production was initially conceptualised around an array of policy areas that stretched from policing to waste collection to mental health (Alford 2014). Co-production's early examples shared the notion that by involving citizens in producing policies they used, the specific

services could be delivered at a higher quality and more efficiently (Alford 2014). This version of co-production was described in relatively simplistic terms as the "…mixing of the productive efforts of regular and consumer producers" (Parks et al. 1981, 1002). In other words, they suggested the production — not just consumption — of policy could be improved through the involvement of citizens in the development phase of the policy cycle (Parks et al. 1981; Ostrom et al. 1979). From this initial coinage, research and practice have continued to explore the relationships between 'producers' of public services with 'consumers' in co-productive processes (Brandsen & Pestoff 2006).

Although co-production is a concept that has been widely explored in research and policy settings for the last 40 years, it does not have a universally recognised definition. Instead, co-production has come to be known as a loose set of principles and characteristics akin to a philosophy or culture (Voorberg, Bekkers & Tummers 2015). Without being narrowly defined, co-production has been applied in various settings and has opaque boundaries between what can be assessed as co-production and not (Voorberg, Bekkers & Tummers 2015). The wide application of co-production can make it challenging for individuals and organisations involved in these processes to share a common understanding of their co-productive responsibilities and the potential outcomes this approach may achieve (Brandsen & Pestoff 2006). This makes it important to further evaluate the outlines of co-production and clearly delineate its boundaries so these processes can successfully engage diverse communities (Blomkamp 2018). Therefore, I will explore key attributions of co-production, particularly as the concept has been used in empirical settings.

One fundamental principle prevalent amongst co-production scholars is that co-productive processes should enable substantive participation (Bovaird 2007). Co-production seeks to facilitate a type of participation reminiscent of 'citizen power' as conceptualised in Arnstein's *Ladder of Citizen Participation* (Bovaird 2007). This conception of participation puts forward the idea that the public — those with a concern surrounding a given issue but have no formal training or expertise — can contribute towards the production processes at hand and be included in decision-making (Bovaird 2007). Co-productive participation goes beyond the idea of representation. Instead, participation in co-productive processes is imagined as extending power and developing a sense of partnership between the different individuals and groups involved (Bovaird 2007). These ideals surrounding participation, its dimensions and functioning, are crucial defining principles of co-production.

Another critical principle of co-production is the recognition that expertise can be widely held and take multiple forms. In the NPM model of decision-making, expertise is considered a skill set that is narrowly possessed by trained professionals who can perform technocratic activities (Gregory 2017). While the co-production model recognises this form of expertise, it also recognises expertise to be a quality that can be gained through different types of activities (Jasanoff 2004). For instance, co-production proponents believe that expertise can be acquired from professional learning activities, experiential training in alternative forms of learning, and through analysing everyday practices (Jasanoff 2004). Expertise in the co-production framework is not determined by one's professional education and ability to speak using a particular vernacular. Instead, expertise highlights an individual's ability to understand a concept or process on a deep level and have an ability to dynamically grapple with it (Jasanoff 2004). Co-production seeks to expand traditional understandings of how expertise can be gained, who is ascribed the label of an expert and considers what the role of experts should be.

Developing trusted and respect between individuals through long-term relationships is another feature of co-productive processes. Co-production brings diverse groups of individuals through participative relationships. Over time, these exchanges can foster collaboration, reciprocal learning, innovation, and, ultimately, the development of respect and the building of trust (Fledderus, Brandsen & Honingh 2014). Co-production is an approach that builds trust and develops respect between those traditionally positioned as policy ‘makers’ and policy ‘users’ through open dialogue, mutual cooperation, and ongoing exchanges (Fledderus, Brandsen & Honingh 2014). Developing trust and respect in the co-production framework is a two-way street. The public should gain new respect and trust in policymakers and practitioners, but equally as vital, ‘professionals’ and those in positions of esteem also must develop respect for the citizens involved in co-production (Voorberg, Bekkers& Tummers 2015). Co-production is distinctive in part for its ability to facilitate respect and trust-building between the individuals that might otherwise simply tolerate one another in a standard participative process.

Co-production is an approach centred on actively involving citizens and the public throughout developing the policies or services they use. This is a critical characteristic that separates co-production from well-established participative approaches such as a consultation or public notice and comment processes (Needham 2008). Unlike other participative approaches, co-production does not position policymakers as presenting information and the public as

responding to what they are told (Needham 2008). Instead, co-production aspires to place individuals in a collaborative, ongoing dialogue where all involved have the capability to shape policy outcomes together (Fledderus, Brandsen & Honingh 2014). Citizens and the public are considered a valuable partner of policymakers in the co-productive model (Needham 2008). This framing aims to move away from hierarchical relationships between those involved in a traditional participative process (Voorberg, Bekkers & Tummers 2015). Co-production attempts to position individuals participating in a process together as co-equal partners, all with valuable skills, knowledge, resources, and experience to contribute. (Jasanoff 2004; Voorberg, Bekkers & Tummers 2015).

Co-production may have the potential to achieve more rigorous, nuanced outcomes than the results of traditional NPM approaches (see Blomkamp 2018). For example, co-production processes that bring together diverse forms of knowledge and understanding can reach nuanced and comprehensive results on complex issues that traditional approaches using limited sources of knowledge may fail to achieve (Bovaird 2007). Additionally, co-production is thought to effectively elevate underrepresented, outsider, and unique voices into decision-making processes (Bovaird 2007). By building trust and respect through extended relationships, co-production can enable views and issues that are typically ignored to gain newfound recognition (Fledderus, Brandsen & Honingh 2014). In the context of urban climate policy development, co-production's key features create the opportunity for meaningful policy outcomes to be determined by effectively utilising the existing sources of knowledge, skills, networks, resources, and capacity that conventional approaches overlook or intentionally disregard. As Jansanoff (2004) considers, this is because of co-production's aspirational objective to enable individuals from a variety of backgrounds to share power and responsibility during a process while working together in reciprocal, caring, equal relationships.

While co-production has theoretical potential that is relevant for urban climate policy development, there are also challenges for the claims made of co-production to be realised. For instance, co-production requires a large amount of resources, capacity and time (MacArthur 2016). Bringing together a broad group of individuals on a consistent, ongoing basis can place significant demands on the organisation leading a co-productive process and those involved (Alford 2014). Moreover, the individuals who participate in a co-productive process must manage the responsibilities associated with supporting the process against their additional professional and personal commitments (Alford 2014). Co-production processes are also

cumbersome to facilitate due to their messy, nonlinear character (Flinders, Wood, Cunningham 2016). Since co-productive processes rely on co-equal collaborative partnerships, they typically lack firm leadership and guidance (Needham 2008). This can cause co-production processes to meander and evolve over time in ways that may be difficult to predict (Needham 2008). Unexpected decisions are common, making flexibility essential to co-productive processes (Needham 2008). The challenges associated with the practice of co-production can make the positive claims made about it difficult to achieve.

Meanwhile, there are also obstacles associated with the politics of co-production. First, co-production's practical challenges can make it a risky proposition to facilitate (Flinders, Wood, Cunningham 2016). The demands of co-production and its inherent procedural uncertainties can make it difficult to achieve discrete outcomes within a prescribed timeframe (Flinders, Wood, Cunningham 2016). This tension requires a flexible politics and willingness to assume unpredictability (Flinders, Wood, Cunningham 2016). Co-production's positive theoretical claims can also be inadvertently undermined if the organisations leading these processes have limited resources and capacity (MacArthur 2016). Facilitating co-production requires managing complex sets of institutional, social, cultural and interpersonal relationships that are ingrained within these processes (MacArthur 2016). If organisations do not possess the capacity to manage co-production, the conflicts and tensions that emerge can become detrimental to the objectives the process intends to address (Oliver, Kothari & Mays 2019). The nuanced and sensitive power relationships surrounding the politics of co-production can also create challenges during these processes. There are often complex or competing incentives that arise during co-productive processes, making it necessary for the organisations leading these processes to defuse potential power disputes that may arise (Farr 2017). While the practice of co-production has been praised for its potential to support inclusive forms of public engagement, these arrangements must be able to mediate the politics of power inequities between participants if these processes are to support meaningful participation (Perry & Habermehl 2020).

As I analysed earlier in this section, co-production remains ambiguously defined as a concept despite interest from scholarship and practice for more than 40-years. To examine the ambiguity of co-production, the section explored the concept's origins and evaluated its key characteristics and the theoretical claims that have been made about it. These claims suggest co-production may have the theoretical potential to support meaningful local climate action by

addressing its deficiencies within conventional decision-making approaches, namely limiting the scope of involved perspectives that engage in contesting and determining policy outcomes. The section also assessed the scholarship's claims made about co-production and analysed some of the challenges for co-production in politics and practice. With these understandings surrounding the theoretical dimensions of co-production, I will next explore how the concept could be applied in practical policy development settings and further examine its challenges in these particular contexts.

3.2 Co-production as a policy development approach

There are a variety of approaches policymakers have used to develop public policy. Over the previous 40 years, public policy in developed countries has typically been developed through technocratic policy development methodologies. While the concept of co-production has been explored by scholarship for some time, it has received relatively limited empirical inquiry, particularly in policy development settings (see Bovaird et al. 2015). In this section, I specifically conceptualise the features of co-productive policy development. Co-production staunchly differs from the highly technical, professionalised cultures of traditional governance models found in NPM. This gives co-productive policy development the potential to produce unconventional, even radical, policy outcomes if the approach were realised in practice. Therefore in this section, I evaluate co-productive policy development as it has been considered through scholarship. This will enable later analysis of how the concept might specifically support urban climate policy development and shape urban climate policy distinctly from conventional policy development approaches.

Co-production, as it has been applied to policy development, is grounded upon the same set of principles as the broader co-production concept (see Figure 3). Co-productive policy development aspires to be a socially just and empowering approach that designs policy actions through inclusive public participation (Bussu & Galanti 2018). To facilitate highly inclusive forms of public participation, co-productive policy development supports the ideal that citizens should have an active role throughout the policy development process (Bussu & Galanti 2018). Citizens and the public are involved throughout every stage of the co-productive policy development framework beginning with agenda-setting and problem identification through the entire process to decision-making, implementation, and evaluation (Bussu & Galanti 2018). Conversely, conventional policy development frameworks have been technocratically

oriented, prioritising involvement from practitioners and policy professionals (Fischer 2017). Traditional policy development frameworks have been top-down and bureaucratic, positioning public participation as a narrow activity that should occur through forms of consultation (Fischer 2017). Co-productive policy development diverges from traditional approaches based on the depth of citizen involvement.

Figure 3. Dimensions of co-productive policy development

(Author's own, drawing on Bussu & Galanti 2018; Voorberg, Bekkers& Tummers 2015; Fledderus, Brandsen & Honingh 2014; Needham 2008; Jasanoff 2004; Ostrom 1996)

Characteristics of co-productive policy development	**Description**
Citizen and public involvement	Engaging citizens and the public throughout the policy development process as co-equal partners (Bussu & Galanti 2018).
Valuing different forms of knowledge	Considering diverse forms of specialist and tacit knowledge as having equal significance for policy decision-making (Jasanoff 2004).
Potential for 'creative synergies'	Dynamic interactions between participants cooperatively involved in a policy development process where scientific data and professional insights are brought together with experiential understandings and local knowledge to solve problems together (Ostrom 1996).
Iterative experimentation and learning	Creative, deliberative, collaborative exchange between individuals involved in the process that supports the development of new ideas and understandings (Needham 2008; Voorberg, Bekkers, Tummers 2015).
Transparent communication and enhanced accountability	Open, consistent dialogue between the individuals involved in the process that supports trust building and democratic responsibility (Fledderus, Brandsen & Honingh 2014).
Horizontal, cooperative leadership structures	Leadership is decentralised and distributed between those involved in the process through co-equal partnerships. (Bussu & Tullia Galanti 2018).

Co-productive policy development frameworks consider citizens and the public to possess critical skills and knowledge, justifying their inclusion throughout a policy development process. Citizens and the public are positioned as co-equal partners during co-productive policy development processes (Needham 2008). Conventional climate policy development approaches regard citizens to lack the knowledge and understanding needed to participate in policy design (Rice, Burke & Heynen 2015). These traditional approaches see the public as having a discrete role within policy development where they can raise issues and highlight concerns (Rice, Burke & Heynen 2015). Co-productive policy development approaches move far beyond the 'comment-box' model of consultation because co-production regards citizens

as possessing unique skills and knowledge that can be incorporated into comprehensive policy development (Needham 2008).

By fostering effective communication and enhanced accountability, co-productive policy development also creates opportunities to support elevated inclusivity compared to traditional policy development approaches. The individuals who participate in professionalised, technocratic policy development processes use jargon to signal their fluency around a set of issues to one another and to act as an exclusionary barrier limiting non-specialists from engaging (Voorberg, Bekkers & Tummers 2015). Co-productive policy development approaches may instead foster more clear forms of communication between participants with different knowledges that might use different specialist vernaculars (Voorberg, Bekkers& Tummers 2015). For issues to be deliberated by broad groups of participants in co-productive policy development processes, they need to be discussed using common verbiage to enable participation (Voorberg, Bekkers, Tummers 2015). Through co-productive policy development's potential for supporting effective communication, it may be able to support new forms of meaningful public participation.

Co-productive policy development recognises that there are many ways of knowing, leading to different forms of understanding (Jasanoff 2004). Co-production also recognises that these different types of knowledge each have their strengths and limitations (Jasanoff 2004). The stratified perception of knowledge in co-productive policy development processes makes it necessary to value diverse knowledges as having the potential to co-equally support decision making (Bussu & Galanti 2018). While well-established public participation methods such as consultations value different forms of knowledge hierarchically, co-production seeks to evaluate different knowledges based on their contextual utility and relevance (Healey 1998; Needham 2008). For highly complex and intricate policy areas such as climate change, developing policy using a broad range of available diverse knowledges may be able to produce policy solutions that fully engage with the systemic nature of the challenge (Voorberg, Bekkers & Tummers 2015).

There are different ways an individual accesses and gains knowledge that can be used during policy development processes. The most common form of knowledge used in conventional policy development processes is specialist knowledge. Specialist knowledge is produced through formal deduction and acquired by an individual through traditional study (Collins &

Evans 2008; Blackler 1995). This form of knowledge is communicable and can be transferred from person to person and used in different contexts (Collins & Evans 2008). Individuals can own or possess specialist knowledge and apply it broadly, distinct from any singular context (Blackler 1995). Due to how specialist knowledge is gained, it can be relatively straightforward to accumulate (Collins & Evans 2008). Tacit knowledge is another form of knowledge that can be used for policy development. This type of knowledge is generated through ordinary everyday practices and can be made explicit through perceptive reflection (Popper 1972). Tacit knowledge cannot easily be transferred to others because it is place-based (Popper 1972). It is typical for an individual to possess a deep level of nuance tacit knowledge on a narrow subject area because of how tacit knowledge is learned (Popper 1972; Collins & Evans 2008).

A core differentiation between co-productive policy development and technocratic policy development approaches is how knowledge is conceptualised and valued. While co-productive policy development and technocratic policy development frameworks both value specialist knowledge as a central input in the policy development process, only co-productive policy development approaches recognise tacit knowledge as equally significant for policy development. Co-productive policy development upholds tacit knowledge as practical, individual, and action-oriented knowledge gained through personal lived experiences (Blackler 1995). Co-productive policy development approaches situate lay forms of tacit knowledge as having the potential to be equally valuable alongside specialist forms of knowledge (Campbell & Vanderhoven 2016). However, organisations leading co-productive policy development processes must ensure both specialist and tacit forms of knowledge are given equal power in decision-making in addition to accepting their equivalent value (Farr 2017).

In addition to supporting extensive citizen involvement and valuing different forms of knowledge, co-productive policy development frameworks also value ‘creative synergies’ over bureaucratic efficiency. Creative synergies are dynamic interactions between participants cooperatively involved in a policy development process where scientific data and professional insights are brought together with experiential understandings and local knowledge to solve problems together (Ostrom 1996). These creative synergies seek to expose existing but hidden and untapped resources, expertise, and assets that can be utilised to form innovative policy solutions (Durose & Richardson 2015). This process of facilitating creative synergies supported within co-productive policy development frameworks is often messy and time-consuming — it is challenging to achieve through linear, preplanned activities and requires

flexibility (Durose & Richardson 2015). Traditional policy development approaches are typically based on binary relationships between policymakers and professionals who value resource and capacity efficiency (Archer & Dodman 2015). Efficiency in conventional policy development frameworks is achieved through bureaucratic processes that are poorly suited to promote creative synergies (Béné et al. 2018; Archer & Dodman 2015). Therefore, co-productive policy development approaches can support adaptability and procedural adjustments in the service of creative synergies.

Co-productive policy development approaches additionally diverge from bureaucratic efficiency by encouraging iterative experimentation and learning. Individuals engaged in co-productive policy development processes collaboratively exchange their diverse knowledge, foster mutual learning, and create opportunities to experiment with new ideas (Needham 2008). This form of policy design is supported by a flexible approach that acknowledges the iterative nature of creative, deliberative problem solving (Voorberg, Bekkers, Tummers 2015). Co-productive policy development frameworks facilitate iteration through idea development, experimentation, reflection, and evaluation (Durose & Richardson 2015). Iteration in policy development is an active process of learning by doing, collaboratively prototyping new ideas, and redesigning ideas as learning takes place (Durose & Richardson 2015). This iterative process takes time and is unpredictable. The individuals involved in co-productive policy development need to have patience and accept that reaching an outcome may appear disorganised (Needham 2008). This quality of iterative adaptability is a key feature of co-productive policy development approaches that deviates from static, inflexible efficiency promoted by traditional technocratic frameworks.

In principle, co-productive policy development is an approach that fosters transparent communication and enhanced accountability compared to conventional policy development frameworks. Effective co-productive policy development processes should support open dialogue between the involved participants and broad transparency surrounding decision-making (Bussu & Tullia Galanti 2018). Strong communication builds trust between individuals during the policy development process and creates learning opportunities (Fledderus, Brandsen & Honingh 2014). Furthermore, transparency in terms of financial and practical choices made during a co-productive policy development process breeds enhanced democratic responsibility where the public can hold policymakers to account on the most relevant issues (Bussu & Galanti 2018). Traditional technocratic policy development frameworks often lack meaningful

communication because the public is excluded from participating in many activities within the policy development process (Fledderus, Brandsen & Honingh 2014). This can lead to accountability oversights and democratic weakening when the public is not given an insight into why policy decisions were made (Bussu & Tullia Galanti 2018). Through principals such as supporting high levels of participation and broadly defining expertise, co-productive policy development may be able to foster vigorous communication and added accountability.

Co-productive policy development approaches also have more horizontal, cooperative leadership structures than centralized, hierarchical leadership models found in conventional policy development approaches. Leadership in co-productive policy development frameworks is relatively distributed between individuals involved in the process (Bussu & Tullia Galanti 2018). The participants in a co-productive policy development process are typically accountable to each other; no central figure or institution solely provides leadership (Durose & Richardson 2015). While a high profile or senior individual may bring a group of participants together in a co-productive policy development process, their centralised leadership alone is not enough to maintain the group over time (Bussu & Tullia Galanti 2018). Alternatively, conventional climate policy development approaches rely on a central person or small group of individuals to set objectives and provide leadership over a bureaucratised network of individuals who contribute supportive actions (Bulkeley & Betsill 2013). Traditional professionalised policy development approaches rely on strong concentrated leadership, unlike co-productive policy development approaches that distribute leadership.

As co-productive policy development occurs through horizontal leadership structures, the participants engaged in the process are guided by a set of shared values and objectives rather than a managing individual. Participants in a co-productive policy development process could be led by a common goal, sense of a mutual commitment, or shared priorities (Bussu & Tullia Galanti 2018). This form of leadership is amorphous and demands that participants have a sense of obligation towards each other and their collective objective (Bussu & Tullia Galanti 2018). As there is typically no strong, prominent leadership force in a co-productive policy development framework, participants frequently engage in a lengthy deliberation process to make crucial decisions together (Durose & Richardson 2015). The lack of unitary leadership can produce stagnation if common ground cannot be found (Bussu & Tullia Galanti 2018). While not having a central leader can create opportunities during co-productive policy development processes, it is also a quality that can lead to challenges.

Co-productive policy development is an approach that has been evaluated in a limited range of empirical settings. It has been explored in particular areas such as social care, waste collection, and healthcare, though in limited climate policy contexts. Co-productive policy development aspires to be socially just and empowering by supporting high levels of public participation that co-equally values knowledge contributes from diverse communities. It encourages creative synergies, fosters communication, supports accountability, and has horizontal leadership structures. Co-productive policy development also has notable challenges that can make it a difficult approach to facilitate. After exploring co-production's origins, theoretical claims, and challenges, I will consider how co-production might apply in urban climate policy development settings. Furthermore, I will synthesise how the approach might support novel policy outcomes that are distinct from climate policies produced through conventional approaches.

3.3 Conceptualising co-productive urban climate policy

This final section of the chapter synthesizes a theoretical model of co-productive urban climate policy development and considers the potential policy outcomes this approach may determine. In doing so, I evaluate how a co-productive framework might achieve policy outcomes that diverge from those produced through traditional approaches. There are key features of co-production that differentiate it from the professionally oriented, technocratic methods of traditional governance approaches. Therefore, I utilise this analysis of co-productive policy development to consider what this approach might offer in the specific context of urban climate policy. In doing so, I consider how co-productive urban climate policy development methods and conventional processes differ in their approaches to the seven factors that influence urban climate policy development that I analysed in Chapter 2. This final section considers how co-productive approaches might support determining novel urban climate policy outcomes by analysing these distinctions.

As I examined earlier in this chapter, co-productive policy development is an area that has received relatively limited empirical analysis in research. This is due to few government organisations having explicitly attempted to facilitate co-productive policy development processes (Bovaird et al. 2015). With the limited empirical evidence analysing co-productive policy development, the theoretical claims made of co-production and its radical aspirations require further exploration. Some local governments have gained interest in novel policy

development approach to negotiate the social, economic, and political urban struggles that bureaucratic policy systems have traditionally struggled to navigate (see Lefebvre 2003 [1970] & Harvey 2008). For instance, Greater Manchester, United Kingdom, has had some experience with co-production as an approach to research and subsequently has considered whether it may be an appropriate policy development framework to realise sustainable urban transformation (see Perry & Atherton 2017). Greater Manchester's limited background supporting research co-production and developing a co-productive environmental communication platform has led the city-region to gain interest in further exploring the concept in the sphere of climate policy development (Perry & Atherton 2017). As interest grows for co-productive urban climate policy development in practice, there is a need to analyse how this untested approach might determine policy outcomes that differ from conventional approaches (see Figure 4).

A key feature that would differentiate urban climate policy development from traditional approaches would be the particular stakeholders involved in the process and how their contributions would be recognised, assessed and value. Conventional processes seek participation from specialist experts and technical practitioners and narrowly support public engagement during isolated periods during the policy development process (see Chapter 2.3). Furthermore, when traditional processes bring together diverse voices through specific activities such as a public consultation or public commentary meeting, these efforts have been critiqued for tokenising heterodox perspectives (Fischer 2017). Alternatively, co-productive processes would seek to bring together unconventional constellations of stakeholders. Co-productive urban climate policy development processes would strive to bring together a fuller range of perspectives on climate represented by technocratic professionals and policymakers, alongside activists, third sector professionals, and citizens. Additionally, these various perspectives would be valued equally within the guise of co-production and hold co-equal decision-making power (Joshi & Moore 2004). Unlike technocratic processes, co-productive approaches would seek to meaningfully debate, contest and determine policy across the range of existing perspectives.

Figure 4. Imagined impacts of co-productive urban climate policy development that address constraints of traditionally developed urban climate policy

(Author's own, drawing on Fischer 2017; Flinders, Wood, Cunningham 2016; Alford 2014; Needham 2008; Bovaird 2007; Joshi & Moore 2004; Ostrom 1996)

Constraints within conventional urban climate policy development approaches that co-production is positioned to respond to	**Subsequent gap within conventional urban climate policy development**	**Imagined alternative responses from co-productive urban climate policy development approaches**
Limited range of perspectives on climate change formally engaged through policy-making activities.	• Range of considered policy options limited to those considered within conventional boundaries; • Transformative policy solution may struggle to gain traction; • Heterodox policy priorities and proposals may struggle to enter into the process; • Factions of the public whose views not reflected in decision-making disengaged.	• Inclusive stakeholders engaged and empowered through novel policy development configurations; • New contributions from diverse stakeholders respected and equally considered; • Unconventional policy solutions have an opportunity to enter into decision-making.
Lack of policy debate and negotiation between diverse perspectives	• Only a narrow set of existing policy ideas evaluated into negotiation; • Limited scope provided for lengthy policy debate; • Narrow distribution of decision-making power constricts vigorous policy negotiation; • Weak forms of contestation skew debate toward elite or mainstream interests.	• Policy contestation given an opportunity to take place between stakeholders in new deliberative spaces; • Debate between broader base of knowledges supports more robust policy dialogues and negotiation decision-making; • Potential for historically marginalised policy topics to gain traction.
Rigid, linear policy development framework with decision-making powers held by professional specialists.	• Policy negotiation structured formulaically, restricting variable deliberation between topics; • Views of technical, professional specialists elevated in decision-making process and given elevated powers; • Policy debates are time bounded, restricting potential negotiation.	• Potential for creative synergises to develop; • Enabling of imaginative problem solving techniques; • Decision-making power distributed evenly across involved stakeholders support potential for unconventional policy determinations; • Possibility for new policy ideas to be collaboratively developed.

Another quality that separates co-productive urban climate policy development from conventional approaches is how policymaking power is distributed. Co-production aspires to facilitate 'citizen power' during decision-making processes (Bovaird 2007). Co-productive approaches would attempt to empower the diverse range of stakeholders involved to support decision-making alongside policymakers as co-equal partners. This conception of power is a stark distinction from conventional representations of climate politics that tightly vest decision-making power with professional policymakers who decide how to utilise their control over the process (Owens 2000). Co-productive urban climate policy development and its conception of power does, however, have specific challenges. Policymakers and organisations who traditionally possess power during these processes must be willing to distribute their power, a shift that demands substantial mutual trust between those involved in the process (Bovaird 2007). Furthermore, equitably distributing power through co-productive arrangements could also be perceived as risky politics. When all of the stakeholders involved in a co-productive decision-making process share power, the outcomes of that process cannot be determined by the narrow set of interests that control decision-making in conventional approach (Flinders, Wood, Cunningham 2016). Co-productive urban climate policy development's distribution of power may create new opportunities but also challenges.

Co-productive urban climate policy development is also distinct by its nonlinear, messy character. As co-production strives to allocate decision-making power through collaborative partnerships between the stakeholders involved in these processes, these approaches can meander as they transpire and change over time (Needham 2008). Therefore, co-productive urban climate policy development arrangements may have the potential to overrun estimated timelines, broach unforeseen policy dialogues, or have their objectives changed over time (Alford 2014). Alternatively, technocratic approaches are often carefully managed by the policymakers controlling the process and have the ability to maintain preordained objectives and agendas (Fischer 2017). Co-productive urban climate policy development's messiness may create new opportunities to facilitate creative synergies where meaningful policy contestation and experimentation can occur. However, this also may create additional resource and capacity requirements to facilitate integrating those different forms of knowledge and navigating uncertainties that may develop (Joshi & Moore 2004).

These distinctions between co-productive and conventional technocratic approaches to climate policy development could affect the seven factors that influence urban climate policy development, potentially supporting novel policy outcomes. As illustrated in Figure 2, the theoretical claims made of co-productive approaches provide it with the potential to determine policy outcomes distinct from those produced through traditional approaches. Co-productive urban climate policy development's distinctive features as synthesised from the literature demonstrate this approach may have the potential to ameliorate the gaps of conventional urban climate policy development processes as evaluated in Chapter 2. These possibilities to mitigate the weaknesses of technocratic urban climate policy development and growing intrigue for co-productive approaches from some local government organisations demonstrate the demand for empirical analysis of these areas.

This chapter has aimed to analyse co-production, explore the theoretical claims that have broadly been made about it, and conceptualise its possibility for determining climate policy that address the weaknesses found within conventional urban climate policy approaches. The results of this chapter's analysis demonstrate that while there is much that is unknown about co-production in urban climate policy development settings, it appears that a co-productive approach may offer opportunities to navigate some of the shortcomings found within traditional technocratic processes. Through its analysis, the chapter has constructed a conceptual framework hypothesising how co-productive urban climate policy development may determine novel policy outcomes by navigating the deficiencies of traditional approaches.

4. Methodology & Methods

Thus far, the thesis has explored and developed the conceptual framework in Chapters 2 and 3 that respond to the challenges raised in Chapter 1. The conceptual framework has synthesised a model for understanding contemporary approaches to climate policy development at the urban scale of politics and evaluated its weaknesses as narrowly engaging only a specific set of perspectives in formal policy debates, lacking the flexibility to support robust policy contestation and centring technocratic policy measures that are elevated by professional specialists. The conceptual framework then evaluated the concept of co-production and conceptualised its theoretical claims as a policy development approach. The following chapter will now set out how the conceptual framework will be applied in an empirical research setting to develop new understandings to address a critical gap in present knowledge.

This chapter begins by reiterating the research aim, objectives, and research questions in the context of the preceding conceptual framework. I then explore the research's case study approach and selection of Greater Manchester, UK. Next, the chapter explores 'embeddedness' and the embedded research approach that enabled the study to utilise a process of learning through action and reflexive analysis. The embedded research approach provides this study with a unique perspective used to evaluate the challenges and opportunities of developing co-productive climate policy in a particular organisational and political urban context. The chapter then explores the fieldwork approach and the specific set of research methods that I used to collect data and examine what each method contributes to the overall research. Finally, the chapter concludes by discussing how the data I collected were analysed and evaluated and considers the ethical implications of this research along with the steps taken to mitigate potential risks.

4.1 Research aim, objectives and research questions

This research aims to investigate how co-productive urban climate policy development is understood and applied within local government organisations, its potential to produce meaningful urban climate policy actions, and its implications for the individuals and organisations involved in the co-productive policy development process. This research builds upon the growing recognition from many local government organisations that increasingly urgent climate policy action is needed from cities to avoid the most dangerous climate crisis

trajectory the world is currently on path to confront (see Chapter 2.1). Urban climate policy action requires policymakers to develop policy through inclusive, cross-sectoral frameworks that engage various stakeholder groups (see Chapter 2.5). Urban climate governance is a field that has been evaluated at length, and there is growing interest from both scholarship and practice surrounding new, inclusive policymaking approaches that might produce meaningfully climate policy action that also promotes just social development (see Chapter 2). Meanwhile, co-production has been analysed in multiple settings and there have been theoretical claims that it may be an approach well-suited to bring diverse communities together to produce policy outcomes collaboratively (see Chapter 3). This research aims to explore distinct areas of established inquiry — urban climate governance and co-production — and evaluate their under-examined emerging connections.

The research objectives that emerged through exploring the productive gap within the research aim are as follows:

- To develop a framework for analysing the effectiveness of co-productive urban climate policy development;
- To understand the opportunities, challenges, consequences, and limitations of co-production as it is applied in local government policy development processes;
- To make a distinct contribution to scholarship and practice by applying and reflecting on the process of attempting to employ co-productive urban climate policy development.

I seek to answer the following research questions that are inextricably linked to the objectives and arose from the research's aim:

- How is co-productive urban climate policy development understood and applied by different stakeholders involved in a co-productive policy development process?
- How might a co-productive approach support urban climate policy development and what are the limits?
- What are the consequences of co-production as an urban climate policy development approach for local government organisations and involved stakeholders in addressing the challenges and opportunities of climate action?

4.2 Case study research & selection

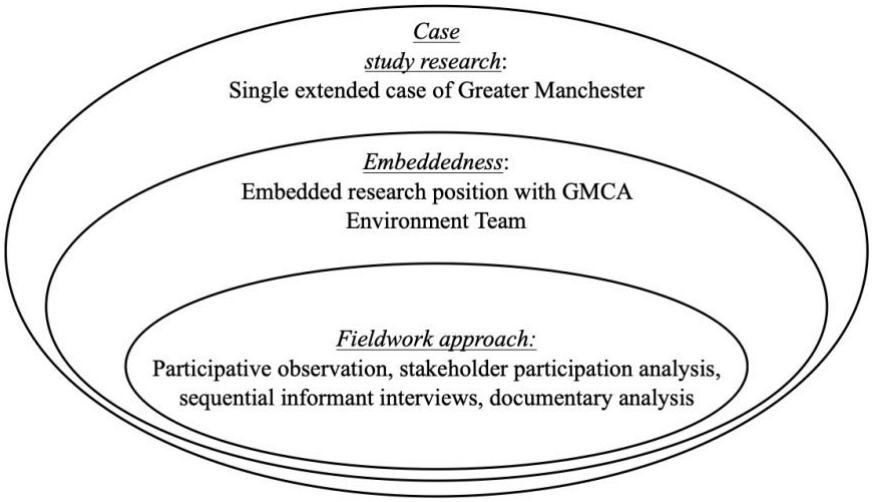
This research takes place within a case study research design (see Figure 5). As posited by Burawoy (1998) and Flyvbjerg (2006), case study research can provide sufficient attention and scrutiny to the complexities and contradictions of the social world. Case study research can facilitate a thorough examination of the complex web of actors, relationships, power, resources, and knowledge at play in shaping urban governance processes (Yin 2017). This makes case study research suitable for evaluating nuanced meaning from tangled social processes. Furthermore, I have adopted a case study approach because case studies are uniquely advantageous for exploring *the urban* and the intricacies of urban governance (Yin 2017; Muir 2008). Case study research can be a practical, effective approach for scrutinising urban governance processes because it is well suited for incorporating multiple research methods that analyse a discrete socio-political area (Yin 2017; Muir 2008).

This research has utilised a single case study approach for several reasons. First, an embedded research position was established as the foundation for this study (see Chapters 4.3.1 and 4.4). Second, a single-case study can effectively evaluate a specific mechanism, dynamic, phenomenon, or process that exists in the world (Small 2009). Lastly, a single case study is well suited for facilitating embedded approaches to analysis, one of this study's key objectives (Small 2009).

Given the research aims, objectives and questions, this study adopted a single case study methodology as per the reasons outlined above. However, there are other case study research designs that could have been employed but were not selected because of their relative strengths and weakness in light of this research's aims. For instance, comparative case studies are often an efficacious research design to evaluate urban political dynamics and investigating a city's place-based contextual uniqueness's (Small 2009). For this study, however, a comparative case study design would have made embeddedness an impossibility, therefore limiting the thesis's potential for investigating in-depth the core research concepts in a particular setting. While a comparative case study design would have arguably made this research's finding more generalisable, this in turn would limit the depth and nuance of the findings (Small 2009). There is no universal case study methodology that is inherently superior for all urban studies research

(Yin 2017; Flyvbjerg 2006). Each study's research aims must be scrutinised to inform what case study approach is best suited for investigating the particular objectives and questions.

Figure 5. Research Design



4.3 Greater Manchester

Greater Manchester, United Kingdom was the case site for this research because an embedded research position was created to enable the study and was one of the first local areas to explicitly attempt to utilise co-production as a climate policy development approach. The embedded research position examined below in Chapter 4.4 resulted from an ongoing research partnership between my academic supervisor and the Greater Manchester Combined Authority's (GMCA) Environment Team. In 2012, these two parties undertook research together, exploring how co-production might support realising just, sustainable cities (see Perry & Atherton 2017). Throughout this research partnership, my academic supervisor and the GMCA Environment Team identified an opportunity to establish an embedded research placement to continue building upon their collaborative research (see Perry & Atherton 2017). This PhD thesis is a direct consequence of that prior research partnership and is the fundamental reason Greater Manchester was selected as the case site for this study.

This thesis and case study have emerged from the previous research program that has created opportunities and parameters for this research. The most significant and evident parameter has

been the selection of Greater Manchester as this study's case. Nevertheless, Greater Manchester's direct experimentation with co-production as a climate policy development approach made it appropriate to evaluate the themes analysed in the conceptual framework (see Chapter 3.3). The second parameter for this research was the developed relationships that I assumed. As this study resulted from my academic supervisor's prior research, I inherited the set of relationships they developed that enabled the research but also navigated. Therefore, I entered this research in the particular established context and had to manage expectations that had been set.

In addition to these parameters, the case site of Greater Manchester also gave this research two additional opportunities to reach insights. The first was the ability to utilise existing relationships to improve the rigour of the research's analysis. Through my academic supervisor, I had access to an established network of individuals and organisations that I could utilise throughout this research. The second opportunity was the unprecedented amount and variety of data I had access to. As this case study was able to take place through an embedded approach enabled by the prior research programme, I could access data that likely would not have been attainable through more conventional approaches.

4.4 Research design: Embeddedness

The methodology of this research design is built upon the case study approach and shaped by the core question of how one might research a co-productive policy development process as an active individual within that process acting as a proponent for co-production. This study resulted from ongoing research and presented this thesis with specific preconditions. One such condition was to support the policy development process this research investigated as a quasi 'animator of co-production' (see 2017 Memorandum of Understanding, Greater Manchester Low Carbon Hub; 2018 Memorandum of Understanding, Greater Manchester Low Carbon Hub). I developed this research methodology while positioned within GMCA, as a traditional PhD methodology would not be appropriate and sufficient for investigating the research aim, objectives and questions. This research methodology is encapsulated in an *embedded research position* that enabled me to investigate the research fully utilising the opportunities gained through the context this study took place within while navigating the parameters.

This case study research methodology adopts an ethnographic approach. Ethnography is the descriptive research practice of people and society — their organisations, processes, cultures, norms, systems, and values (see Agar 1996; Atkinson et al. 2001). Ethnographic research is primarily concerned with evaluating meaning from social activities, and ethnographic researchers do this by meticulously analysing social processes (Atkinson & Hammersley 1998). While there is a broad spectrum of ethnographic research philosophies, ethnographers broadly use deliberative observational methodologies (Marcus 2008). Ethnographers utilise various methods to gain an immersive understanding of the contexts of their subject areas that would be improbable to reach through other social science methods such as key informant interviews and documentary analyses, or surveys (Genzuk 2003). Ethnography and observational methods are not suitable for every research setting but can be an appropriate approach for interrogating specific social processes that require nuanced analysis to evaluate meaning and understand action in context (Genzuk 2003).

There is robust discussion amongst ethnographers surrounding the different forms of observation used to investigate different contexts. For example, some scholars such as Angrosino (2007) and Foster (1996) have advocated for ethnographic researchers to observe their research subjects from a removed vantage point to have a limited influence on their research subjects. This perspective asserts that ethnographic observational methods should separate the researcher from the researched to limit their impact on the research setting and provide researchers critical distance from the research for objective scrutiny (Angrosino 2007). Conversely, scholars including Li (2008) and Lewis & Russell (2011) have argued that ethnographers should not shy away from becoming proximate to their research or even influencing their field of study. Instead, this view maintains that researchers should objectively analyse how proximity to their research subjects might impact those research subjects and their observations and that closeness offers the unique ability to deeply understand the context of the research (Li 2008; Lewis & Russell 2011). An ethnographer's research questions, theoretical lens, and methodological frameworks should guide their decisions about the type of observational approach best suited for their specific inquiry.

In this research, I adopted an embedded ethnographic approach through participative forms of observation. Embedded ethnography situates the researcher within their field of study — alongside the individuals they investigate — enabling analysis of the research as a sociocultural apprentice and positioning the embedded researcher as a vessel that knowledge can circulate

through (Lewis & Russell 2011). Observations made by a reflexive, systemic, self-aware embedded researcher can uncover nuanced knowledge by experiencing particular social processes followed by critical analysis and scrutiny of what they observed (Coghlan 2007). Embedded ethnography is thought to enable researchers to identify and analyse subtle understandings about their areas of study by allowing the researcher to probe the implicit structures that underlie contextual social processes that would be difficult to identify without first-hand knowledge (Brewer 2000). This demands embedded researchers adapt to the "chaos and complexity of social life" during fieldwork activities while adhering to rigorous ethical guidelines and engaging in reflexive analytical praxis to critically evaluate their observations (Brewer 2000, 36). Embedded ethnography can be perceived as existing on a spectrum where on the one end the researcher takes a passive role analysing their field of study as an observer of social phenomena, while at the other end the researcher engages in their analysis as an active member of the group (Brewer 2000). This research's methodology placed me as an embedded ethnographer in a highly involve position in which I took on the role of an *active intermediary*.

Two key elements characterise embeddedness as an ethnographic research approach. The first is that embeddedness — as a methodology and method — attempts to descriptively analyse phenomena through a similar perspective of those being analysed (Reiter-Theil 2004, 23). Embedded researchers may actively support the delivery of services alongside those they collect on, which gives them the ability to identify concealed meaning from the contexts they investigate and more fundamentally know and understand the research setting (Lewis & Russell 2011). The descriptive analysis supported by embeddedness can occur when an embedded researcher evaluates themselves as data, explicating the flows and circuits of information and knowledge that pass through their observations (Lewis & Russell 2011). Embedded researchers can develop descriptive analysis by reflexively evaluating their observations in the field, using reflexive praxis to maintain intellectual space for objective critique (see Chapter 4.7). The closeness embedded researchers can develop with the organisations and individuals they investigated allows them to become quasi-members of the context being studied, enabling them to make complex knowledge contributions through descriptive analysis.

The second characteristic of embeddedness as an ethnographic research approach is the unique depth of knowledge researchers can obtain about the organisations and processes they investigate (Lewis & Russell 2011). Embeddedness positions the researcher to develop a close

connection with those they are analysing. This can cultivate trust and esteem between the researcher and their research subjects, creating space to explore fraught or sensitive research areas that researchers using traditional social scientific methodologies may struggle to examine and understand (Reiter-Theil 2004). If embedded researchers build reciprocal respect with their research subjects, they can acquire a significant amount of data through those relationships, increasing their ability to make in-depth critical evaluations (Le Gallais 2003). Embeddedness enables researchers to gain a profound understanding of the internal dynamics of the contexts and processes they investigate through their observations (Reiter-Theil 2004). Embedded ethnography can support a researcher's ability to analyse a depth of knowledge and understanding from their field of inquiry by building colleague-like relationships with their research subjects and gaining access to significant tranches of descriptive data.

Embeddedness is a crucial component of this study because it can enable researchers to move beyond the potential to analyse 'good ethnography' toward elucidating contextual meaning by dissolving the social layers that can colour understanding of the social world (Brannick & Coghlan 2007). As Van Manen (2016) explains, an accomplished social ethnographer might analyse a specific cultural reality to the degree of a non-member of the group by describing group members' behaviours and patterns. However, an embedded researcher can potentially evaluate meaning from a cultural reality to the level of a group member by analysing the group's social norms, values, and the frames that they experience the world through (Lewis & Russell 2011). Embeddedness can provide researchers with opportunities to distinguish the perspectives that their research subjects see research context through, giving embedded researchers the ability to evaluate "the why" behind specific actions or processes that can only be thoroughly analysed by walking in the participant's shoes (Marcus 2008).

While embeddedness gives this study the potential to develop distinctive knowledge, it also has specific challenges that I have accounted for. The foremost critique of embedded ethnography has been described as the phenomena of "going native" (see Monti 1992; Le Gallais 2003). This describes an embedded researcher becoming absorbed within their research setting and losing their critical capacity required for objective analysis (Brannick & Coghlan 2007). Going native is typically thought of as a slow process that occurs over time (Le Gallais 2003). While going native can enhance the ethnographer's data gathering process, it is thought to result in the embedded researcher losing their ability to critically evaluate their data (Brannick & Coghlan 2007; Lewis & Russell 2011). Although the process of going native has

hazards that can weaken the critical capacities of a researcher, it also offers opportunities through reflexive praxis to analyse ‘thick descriptions’ that can reveal deeper levels of knowing and understanding (Geertz 1973). While I took measures to guard against uncritically going native, a strength of embeddedness within this research was the opportunity to generate these think descriptions about co-productive urban climate policy development that were analysed to reveal distinctive critiques and insights in an empirical policy setting.

To protect against the negative aspect of going native, I developed reflexive practices to maintain my positionality as a critical investigator (see Chapter 4.7). Reflexivity — the "self-critical sympathetic introspection and the self-conscious analytical scrutiny of the self as researcher" (England 1994, 244) — can allow embedded researchers to preserve their critical perspective by engaging in a practice of ongoing self-evaluation (England 1994). Reflexive forms of thought create space for researchers to identify their particular perspectives and recognise how it might affect their interpretation of the world and events (May & Perry 2017). Meanwhile, positionality — "a space in which objectivism and subjectivism meet" (Bourke 2014, 3) — can enable embedded researchers to acknowledge their own subjective biases, preferences, and viewpoints while striving to preserve critical objectivity (England 1994). Achieving pure critical objectivism in any research study is an unrealistic ambition. However, by exploring my positionality as an embedded researcher, it is possible to calibrate my subjectivity into my objective analysis (Bourke 2014). By taking specific actions to mitigate against the risks of going native, I can use embeddedness as a core aspect of this research to analyse meaning and knowledge.

Embeddedness within this research took place through an 'embedded research position' with the GMCA Environment Team. The embedded research position resulted from prior research conducted by my academic supervisor with the GMCA Environment Team. I initially began the embedded research position in October 2017, and the role concluded after 21-months in June 2019. The embedded research position was created to support the GMCA attempt to facilitate a co-productive climate policy development process that was publicly inclusive and engaging. When I entered the field in October 2017, I had already established this research's aims and then spent several months identifying a productive gap between relevant theoretical discourses and the practical hurdles within the GMCA Environment Team.

The embedded research position allowed me to participate in the GMCA Environment's Team co-productive climate policy development process through the four supportive pathways (see 2017 Memorandum of Understanding, Greater Manchester Low Carbon Hub; 2018 Memorandum of Understanding, Greater Manchester Low Carbon Hub). Through the embedded research position, I supported the engagement of practitioners in the policy development process, supported the engagement of non-experts in the policy development process, supported communication and interface with digital engagement tools, and developed intelligence surrounding the broad climate and environmental governance network in Greater Manchester and supported activities to widen that network. I supported these four pathways throughout the co-productive climate policy development process and were identified through discussions between myself, my academic supervisor, and the GMCA Director of Environment (Participative Observation Field Note, 23 January 2018). Extensive fieldwork data was collected on all of the activities I was involved with (see Figure 6)

While I facilitated action through the four pathways outlined above during the co-productive policy development process, the embedded research position also included fulfilling the role of an ‘active intermediary'. An active intermediary is an individual with the ability to bridge organisations, provide resources to support identified opportunities, and bring together different groups of people to work collaboratively toward collective goals in new partnerships (May & Perry 2010). The embedded research position was intentionally designed to allow me to perform the duties of an active intermediary, situated at a crossroads between the University of Sheffield and the GMCA Environment Team (see 2017 Memorandum of Understanding, Greater Manchester Low Carbon Hub; 2018 Memorandum of Understanding, Greater Manchester Low Carbon Hub). The dynamic space I occupied within the embedded research position allowed me to function as an active intermediary during the co-productive climate policy development process by mobilising knowledge, resources, and capacity. My specific functions as an active intermediary changed over the course co-productive climate policy development process, as I particularly evaluate in Chapter 8.

Figure 6. Field work activities and timeline within the embedded research position	
When	**Fieldwork Activities**
Oct. 2017 — June 2019	Participated in monthly meetings as a 'Green Summit Steering Group' member
Oct. 2017- Dec. 2017	Conducted a stakeholder analysis to identify constituencies through Greater Manchester and evaluate gaps within the stakeholder engagement strategy
Dec. 2017 — March 2018	Planned, organised, facilitated and analysed 'Listening Events' across Greater Manchester
Feb. 2018 — April 2018	Planned, led and analysed data from a series of 'breakout rooms' at the 2018 Green Summit
May 2018 — July 2018	Consulted with the GMCA Environment Team to support development of 'Greater Manchester's Springboard to a Green City Region' report
Sept. 2018 — Jan. 2019	Designed, facilitated and analysed data from 'practitioner workstreams'
Jan. 2019 — March 2019	Co-designed and facilitated the 'Public Sector Zone' at the 2019 Green Summit
April 2019 — June 2019	Consulted with the GMCA Environment Team to support development of 'Greater Manchester 5-Year Environment Plan'

The embedded research position situated me within a boundary space between an insider and an outsider. Insiders have easy access to the groups being investigated and can authentically identify truth within the particular cultures they study from the perspective of a member of that group (Merriam et al. 2001). Meanwhile, outsiders are curious about the unfamiliar and have the capacity to probe taboo areas that insiders would be reticent to explore because of the discomfort associated with overstepping norms (Merriam et al. 2001). I was neither an insider nor an outsider during the co-productive policy development process through the embedded research position. Instead, my positionality and relationships that were established through the embedded research position and active intermediary role placed me in a boundary space that was fluid between the insider and outsider.

I mobilised insider traits within the embedded research position that I used to influence the co-productive policy development process and analyse it. As an insider, I quickly built trust with the GMCA Environment Team policy professionals involved in the policy development process (Merriam et al. 2001). I was able to learn the GMCA Environment Team's idiosyncratic cultural norms using the embedded research position and could reflect those norms through my interactions (Merriam et al. 2001). Through embeddedness, I was also positioned to gain

insider access by engaging in the organisation's learning cycles and could my position to evaluate how the novel co-productive approach was adopted and understood (Coghlan 2007). Furthermore, I was able to use thick descriptions to evaluate the GMCA Environment Team's approach to co-production, enabling me to analyse what the organisational barriers were that hindered the potential of the co-productive policy development process (Geertz 1973).

While embeddedness afforded me some insider traits with the GMCA Environment Team, I also possessed several outsider characteristics that supported my ability to influence the co-productive policy development process and form critiques of it. Outsiders lack familiarity with the historical narratives shared between members of the group they investigate and can identify social peculiarities that are not evident to insiders that view these idiosyncrasies as norms (Merriam et al. 2001). As a 'cultural stranger' to Greater Manchester, the personalities and nuanced identities of the different stakeholders who were traditionally involved in local climate politics were all novel to me. My outsider identity also meant the different stakeholders involved in the 5YEP's development process lacked perceptions of me based upon previous interactions. I was able to act as an outsider by questioning the GMCA Environment Team's cultural assumptions and analysing how the organisation's norms and practices hindered the potential of co-production.

Research design approaches in recent years have increasingly utilised embeddedness, although it is still relatively novel and uncommon. For example, the Mistra Urban Future (MUF) programme that has supported multiple embedded research placements, provided PhD researchers with the resources and support to undertake this form of research while also helping them negotiate partnerships with local government organisations – as has been the case of this study. MUF has supported embedded research placements in multiple cities including Cape Town and Sheffield (Taylor 2017; Perry et al. 2019). More recently, the Capabilities in Academic Policy Engagement (CAPE) Policy Fellowships programme, supported by UKRI, is providing funding for senior researchers to undertake placements in order to support policy-research collaborations in England (Capabilities in Academic Policy Engagement 2021). Although this study's conceptualisation of embeddedness builds upon the legacy of these recent developments, it did not take a systemic approach to analysing lessons from them. Embedded research is highly contextualised to the local milieu it is rooted in, making it difficult to draw direct lessons from studies that take place in external contexts (Marcus 2008). Furthermore, many of these relevant embedded co-production studies either took place

concurrently with this study or their findings were only initially emerging during this research. However, general observations were drawn from these previous programmes where possible.

Embeddedness is a central element within this research design. The embedded ethnographic research design allowed me to utilise a participative form of inquiry to evaluate the research context alongside the individuals I observed throughout the co-productive climate policy development process to develop descriptive analysis. This approach has allowed me to evaluate complex meaning and understandings through the research. While co-production has been utilised as a research methodology to produce knowledge in other studies, it is important to unequivocally state that this thesis did not adopt a research co-production approach.

4.5 Fieldwork approach

The foundation of this research's fieldwork approach is the embedded research position. The fieldwork approach utilised a participative embedded ethnographic framework. Participative embedded ethnography highlights the active role I had during the co-productive climate policy development process that this research investigated (Coghlan 2007). Participative embedded ethnography enabled me to investigate this research as a participant observer alongside the research subjects and facilitate action designed to support the policy development process. A crucial aspect of this fieldwork approach includes capturing data on the impact that resulted from my action in the field, analysing my role within this research, and evaluate its meaning. By utilising a participative embedded ethnographic fieldwork approach, this study produces theoretical and practical knowledge grounded in an analysis of the research's empirical and experiential context (Reason & Bradbury 2001).

The participative embedded ethnographic research took place through the embedded research position with the GMCA Environment Team. The embedded research position began with a problem identification phase to narrow the research aim into objectives and questions that met a productive gap between theory and practice. During this phase, I also collected data on all of my fieldwork activities. After synthesising the problem space, the remainder of my time in the field focused on the four primary activities: supporting the engagement of experts in the policy development process; supporting the engagement of non-experts in the policy development process; supporting communications and interface with digital engagement tools; developing an understanding of the broad climate change and environmental policy development network

as currently constructed and support efforts to widen the network (Memorandum of Understand 2018). Data was collected on all of my activities during the 21-month fieldwork period, supporting my ability to evaluate co-productive urban climate policy development.

To summarise, participative embedded ethnography was the central component of this research's fieldwork approach. Having outlined the fieldwork approach and its position within this research, I will explore the four research methods I used throughout the fieldwork period to capture data: participative observation, stakeholder participation analysis, sequential informant interviews, and documentary deconstruction. In examining the research methods, I discuss what each method contributes to the research overall and explain how the data from the four methods enable comprehensive analysis of the research's aims, objectives and questions. Lastly, I explore how the data has been analysed and evaluated to answer the research questions.

4.5.1 Participative observation

The embedded research position captured primary data through two research methods. The first method, participative observation, and the second, documentary deconstruction. The participative observation research method captured data in the form of descriptive and reflexive field notes. The field notes documented detailed information about all of the activities I undertook during the embedded research position. I pursued this method as 'participative observation' rather than 'observant participation' because of the embedded research position's action-oriented nature instead of an observational positioning. Many ethnographic studies predominately rely on observing a given phenomenon as a passive spectator and evaluating meaning from their observations through a reflective process (Atkinson et al. 2001). Meanwhile, this study adopted an active form of observation where I gathered data on the full breadth of activities I observed as a participant within the research (Vinten 1994). This distinction is significant because it provides a rigorous method for eliciting information that draws on the full richness of the fieldwork approach (Vinten 1994).

I captured data on all of the activities I engaged in throughout the embedded research position through the participative observation method. As explored above, my purpose in the embedded research position was to bring knowledge surrounding co-production from theory and translate

that understanding into specific aspects of the policy development process. The four primary tasks within the embedded research position concretely manifested in some of the following activities that the participative observation method captured data on, including:

- Attendance and participation in Green Summit Steering Group meetings
- Planning and facilitation of listening events that engaged different groups of citizens
- Data analysis from listening events and reported findings to different audiences
- Stakeholder gap analysis to support the broadening of public engagement efforts
- Planning, design and coordination of participative 'breakout rooms' at the 2018 Green Summit
- Support writing *Greater Manchester's Springboard to a Green City Region*
- Planning and facilitation of expert workstreams that engaged with technical practitioners
- Development and management of digital communication channels to collaborate with workstream participants
- Engagement of actors from civil society who were interested in the policy development process
- Drafting a policy brief on exploring different governance arrangements that could be used to engage with broad citizen groups across the city-region
- Attendance and participation in GMCA Environment Team meetings
- Co-design and facilitation of Public Sector Zone at the 2019 Green Summit
- Production of draft sections of the 5-*Year Environment Plan*

I engaged in these activities over the 21-month fieldwork period from October 2017 through June 2019. I recorded a detailed field note every day that I participated in an activity related to the embedded research position. These field notes were divided into two sections. The first section of each field note described what transpired during the activities I was involved in or observed. This descriptive section captured detailed, objective information such as who was involved in the activity, what precisely took place, conversation topics, which stakeholders advocated for what positions, and the activity's outcomes. The descriptive section of the field notes enabled me to construct a detailed record of what took place during every stage of the policy development process, allowing me to accurately analyse how various discourses

transpired and led to outcomes during the policy development process (Sánchez-Jankowski 2002).

The second part of each field note focused on reflective analysis of the activities chronicled in the field note's descriptive section. This reflection centres on my reflexive praxis — my identity, standpoint and relation to social power structures — which explicates how I engaged with the co-productive policy development process through the embedded research position and understood that process in accordance with reality (May & Perry 2017). The reflective section of the field notes evaluated the meaning behind the activities described and unpacked the struggles that emerged, such as why individuals adopted particular positions, what may have motivated them to take action and why specific decisions were made. The reflective section enabled me to analyse how the co-productive dimensions of the policy development process evolved over time and how various individuals engaged in it. This section examines how I, as a messy, complicated individual, impacted the co-productive policy development process that this thesis examines by exploring my reflexive praxis within the embedded research position.

The reflective section of my field notes primarily examined how dimensions of my identity, standpoint and relation to power structures affected my actions and impact in the embedded research position. For instance, this section of the field notes would explore dimensions of my identity — body, history, time, space & language — that supported or hindered my ability to take a particular action or understand phenomena distinctly from others involved in a given activity. Similarly, this section of the field notes evaluated my specific position through which I approach a particular activity or policy debate — my standpoint as an embedded researcher (Smith 2005). Furthermore, my reflexive analysis captured within the field notes considered how my relationships to power in different forms influenced the actions I took as well as their reception by those I engaged with and their effectiveness (Milligan 2016). The reflexive praxis developed through this section of my field notes crucially enabled me to evaluate my role within this research and my bearing upon the co-productive policy development process (see Chapter 8).

I collected 110 total field notes that documented all of the activities I participated in through the embedded research position. These field notes provided the participative observation method with rich, granular data that would have been unattainable to collect without an

embedded research approach. The particular data captured through the participative observation method are significant for the research's analysis because it allows me to evaluate the 'sausage-making' that takes place within policy development processes and is beyond the public's view (Bruce & O'Callaghan 2016). Furthermore, the participative observation method collected data alongside the research subjects, allowing me to analyse the frames they used during the policy development process. Although the data gathered through the participative observation method are not replicable, it does have a high degree of validity because participative observation's internal and external validity are integrated into the data collection process itself (Sánchez-Jankowski 2002). Participative observation is an essential method for this research and has allowed me to utilise the access I gained through the embedded research position to harvest a wealth of data giving this research — in conjunction with the other research methods — the ability to analyse nuanced meanings and understandings of co-productive climate policy development.

4.5.2 Stakeholder participation analysis

The stakeholder participation analysis is the second research method that captures data directly through the embedded research position. Before discussing this research method, it is necessary to examine the concept of a *stakeholder* and the meaning of the specific term within this research. The research aim and conceptual framework are principally concerned with investigating participation in urban climate policy development processes. Given this, the research adopts Schmeer's (1999) definition of a stakeholder as "an individual with a vested interest in the policy being promoted" and having an awareness of that policy's development and potential implications (Schmeer 1999, 4). Stakeholders can be individuals, groups of people, or entire organisations (Healey 1998). In a policy development context, a stakeholder could influence the policy's development, be affected directly and indirectly by the policy outcome, or have an interest in the policy reaching a particular outcome (Schmeer 1999). From this definition, the research adopts a typology of three distinctive categories to delineate the types of stakeholders involved in policy development process: policy professionals, active stakeholders, and interested citizens (see Figure 7).

Each type of stakeholder in a policy development process has a different type of power relative to the other stakeholders (see Lukes 2004). For example, policy professionals have vested

formal authority through formal legal structures that grant them power over setting policy on behalf of the public (Christensen & Lægreid 2002). In public policy development processes, policy professionals frequently have the authority to decide what strategies will be formally ratified, what those policies will contain, and how the wider public could be mobilised during policy development (Christensen & Lægreid 2002). Meanwhile, active stakeholders have some power to affect and impact policy development processes using their knowledge, resources, and capacity (Healey 1998). Active stakeholders typically have informal authority in policy development processes and use their position to influence the process rather than direct it (Healey 1998). Lastly, interested citizens have the least amount of power to impact a policy development process but can increase their power collectively with others (Berner, Amos & Morse 2011). Interested citizens have no official involvement in policy development processes but advocate for specific outcomes being achieved and have an understanding of the discourses within the policy development process (Berner, Amos & Morse 2011). The stakeholder participation analysis is a method that is used to evaluate the impact and influence the different types of stakeholders had during the co-productive process.

Figure 7. General Typology of Stakeholders Involved in Urban Climate Policy Development

Stakeholder type	**Role within the policy development process**
Policy Professionals	Granted formal authority within the policy development process. Activity involved day to day decision-making surrounding the policy development process. Have some power to decide what is and is not elevated into the final policy document.
Active Stakeholders	Active within the policy development process through prolonged informal relationships and partnerships with policy professionals. Involved in regular policy development activities but have not formal authority to make policy decisions unilaterally.
Interested Citizens	No regular informal involvement in the policy development process but may sparingly advocate or lobby for particular policy outcomes. Have relatively little influence on the policy development process as an individual but are interested in specific policy outcomes being achieved.

The stakeholder participation analysis collated descriptive data on all of the policy professionals, active stakeholders, and interested citizens who participated during some aspect

of the 5-Year Environment Plan's development process and organised that data in an analytical '*stakeholder participation scorecard*'. The stakeholder participation scorecard was an analytical tool modelled after a similar research tool I designed with my academic supervisor for an ESRC funded research projected called Jam & Justice that analysed a specific phase of the 5-Year Environment Plan's development process (see Perry et al. 2019). The stakeholder participation scorecard aggregated data from internal GMCA Environment Team memos, the descriptive section of participative observation field notes, documents produced through the embedded research position, GMCA strategy documents, and official GMCA meeting minutes. Some of this data, such as official meeting minutes or policy documents, were in the public domain, but most of the stakeholder participation analysis data were gathered through the embedded research position. The stakeholder participation analysis is a method that assesses the influence of each stakeholder who was involved in the 5-Year Environment Plan's development process.

The stakeholder participation analysis evaluated data collected between October 2017 through May 2019. Identifying all of the stakeholders who participated throughout the policy development process was the first step in analysing the data within the stakeholder participation pyramid. A total of 91 individuals were identified in the stakeholder participation scorecard to have directly contributed during the policy development process. After identifying these stakeholders, the stakeholder participation scorecard analysed how and what each of those stakeholders contributed during the process. This evaluation included determining how much time in meetings or official activities each individual contributed to the 5-Year Environment Plan's development process and the type of contributions they made during the policy development process. Finally, the stakeholder participation scorecard evaluated across the total data gathered to analyse each stakeholder's influence during the 5-Year Environment Plan's development process. The stakeholder participation analysis is a research method that synthesised a large quantity of data to evaluate how each stakeholder involved in the 5-Year Environment Plan's development process contributed during the process (see Figure 8).

Figure 8. Stakeholder Participation Scorecard: Columns of Data Evaluated in the Analytical Tool	
Data assessed in stakeholder participation scorecard	**Meaning of analytical tool data headings**
Name	Name of stakeholder
Role	Professional title
Organisation	Organisation stakeholder represented during the policy development process
Policy development pathway they were involved with	Main policy development pathway(s) the stakeholder supported during the policy development process
Formally obligated to participate in the policy development process	Was the stakeholder legally required through their position or expected by precedent to participate in a Greater Manchester level climate policy development process?
Entry into the policy development process	How the stakeholder initially become involved in the policy development process
Duration of involvement in the policy development process	Short term (involved less than 4-months), medium term (involved less than 12-months), long term (involved more than 12 months)
Time contributed to the policy development process	Time in hours spent in official GMCA Environment Team sanctioned meetings, workshops, events, etc. directly supporting policy development process
Significant contributions	Main impacts, effects and influences on the policy development process

The stakeholder participation analysis is an important research method that enables this study to evaluate what specific role each stakeholder fulfilled during the policy development process, what they contributed during the process and the influence they made upon the process. The stakeholder participation analysis notably assesses the role of all of the stakeholders involved in the policy development process across a shared set of criteria, making it possible to identify the discrete impact each stakeholder made during the process. The stakeholder participation analysis is a method this research uses to detangle the many contributions made by the extensive group of stakeholders who supported the 5-Year Environment Plan's development through a variety of activities and — in combination with the other research methods — evaluates how those forms of support tangibly affected the policy development process.

4.5.3 Sequential informant interviews

The sequential informant interviews are the third research method this study has utilised for collecting and analysing data. As the method's title suggests, sequential informant interviews captured data during two stages during the 5-Year Environment Plan's development process. The first stage of data collection took place in the fall of 2018 following the release of a high-level policy report published on 27 July 2018 (GMCA 2018). The second stage of data collection occurred in the spring and summer of 2019 after the 5-Year Environment Plan was official launched by the GMCA on 25 March 2019 (GMCA 2019). The interviews were conducted with policy professionals and active stakeholders who participated in developing these policy documents. The sequential informant interview method explored how the co-productive framework manifested in the GMCA institutional context — perceptions of how different forms of knowledge were or were not legitimated, what stakeholders were listened to and who was not, and how collaborative partnerships developed and changed over time.

The sequential informant interviews took place in two stages. The first phase of interviews was conducted with twelve participants in September and October 2018, which followed the release of "Greater Manchester's Springboard to a Green City Region" that was a precursory report to an official climate strategy that would be further developed and formally adopted nine months later (GMCA 2018). The second round of interviews took place with sixteen participants in May and June 2019 following the release of the "5-Year Environment Plan for Greater Manchester 2019-2024" (GMCA 2019). 28 interviews were conducted in total with 21 different interview subjects (see Annex 1). Seven interview subjects participated in the first and second round of interviews because they were identified as being critical throughout the policy development process's total duration. This method's iterative aspect is significant because it enabled analysis across my observations through the participant observation method and evaluate the perspectives of involved stakeholders while the policy development process was transpiring. This allowed the research to evaluate decisive moments of struggle and conflict from diverse perspectives while they occurred (Schwartz-Shea & Yanow 2013).

The sequential informant interviews were developed in a semi-structured form. The sequential informant interview method began by developing a semi-structured interview guide that determined a narrow set of themes that emerged from the theoretical framework and articulated those themes around open-ended interview questions (Leech 2002; see Annex 2 & 3). The semi-structured interview guide was developed as a framework to examine and probe critical predetermined themes and discourses within the policy development process that could be

flexibly interrogated (Leech 2002). Using the semi-structured interview guide, initial structured questions were asked to the interviewees and following their response, new lines of inquiry emerged and were explored through an unstructured discursive dialogue (Leech 2002). The first and second stages of the interviews used slightly different interview guides that were modified to be relevant for the trajectory of the 5-Year Environment Plan's development process (see Annex 2 & 3). However, both interview guides were based on the same set of themes and principles related to co-productive urban climate policy development that emerged from the theoretical framework. Each interview was also recorded and transcribed.

The participative observation and stakeholder participation analysis methods gathered data directly captured through the b research position. They were reflexively shaped through my subjective observations, perceptions, and interactions. The sequential informant interviews are a research method whose data has been based on the subjectivity of myself as the interviewer guiding lines of questioning. However, this research method also draws on the interviewees' subjectivity to steer the interview in areas they deem relevant and captures data surrounding the co-productive process framed through their perspective. By gathering fieldwork data from the subjective perspectives of the interviewees', this method enables the research to triangulate its analysis between different positionalities (Reiter 2017). As a result of this research design, the research is able to increase its robustness as potential biases or prejudices within the data can be identified and counteracted (Reiter 2017).

4.5.4 Documentary analysis

Documentary analysis is the final research method I utilised in this study. This method gathered data from GMCA's 5-Year Environment Plan as well as through the embedded research position. The documentary analysis method initially evaluated the 88-page 5-Year Environment Plan to identify the plan's discrete policy measures. These narrowly defined policy measures were situated across six thematic areas — energy, transportation, buildings, sustainable production and consumption, natural environment, and resilience and adaptation (GMCA 2019). The documentary analysis method analysed the policy measures against internal GMCA Environment Team documents and field note data collected through the embedded research position to identify where each policy measure originated, how the measures gained traction in the policy development process, what type of knowledge was used to develop the measure. The document dissection method evaluated how the 5-Year

Environment Plan's policy outcomes were conceived, developed, and legitimated (Scott 2014; Mogalakwe 2009). The documentary analysis method contributes to the research by analysing how the policy development process shaped and validated the legitimised policy measures within the 5-Year Environment Plan.

Documentary analysis is an important research method for this study because it enabled me to use the 'behind the curtain' access I had through the embedded research position to evaluate the procedural nuance and messiness that led to a professionally refined policy document. Policy documents are carefully written, polished representations of the negotiated, contested processes that take place to create them (Scott 2014). Policy documents typically remove or minimise the tangled procedures and competing discourses that are ever-present during the policy development process (Mogalakwe 2009). The documentary analysis method evaluates how the 5-Year Environment Plan's policy measures developed from a particular contextualised setting and process that is not articulated in the plan itself. Using data gathered from the embedded research position, the documentary analysis method analyses how the policy development process moulded what became legitimated within the 5-Year Environment Plan. The documentary analysis method evaluates the meaning that went into the 5-Year Environment Plan's specific policy measures through its analysis.

The documentary analysis method organised and assessed data through an organised 'tool'. The first step was to identify all of the discrete policy measures within the 5-Year Environment Plan. The documentary analysis tool defined a policy measure as an actionable policy goal supported by an evidence-base or coherent reasoning with measurable delivery targets (Ryan 2015). Using this definition, I analysed the 5-Year Environment Plan and identified 24 separate policy measures within the plan. I then evaluated internal GMCA Environment Team documents and field note data collected through the embedded research position to determine where each of the 24 policy measures emerged and analysed how each gained traction during the policy development process. Internal GMCA Environment Team documents used for this analysis consisted of departmental memos, meeting minutes, internal reports, and draft policy documents. The documentary analysis tool provides a systemic framework that I used to evaluate how the policy measures ratified within the 5-Year Environment Plan emerged, were justified, and ultimately legitimated through the co-productive process used to develop the policy (see Figure 9; Scott 2014).

Figure 9: Documentary Analysis: Data Evaluated in the Analytical Tool	
Data assessed in the Documentary Analysis tool	**Meaning of analytical tool data headings**
Policy Measure	Policy measure as articulated in 5-Year Environment Plan
Theme	Thematic area (energy, transportation, buildings, sustainable production and consumption, natural environment, and resilience, and adaptation)
Page	Page number described in the 5-Year Environment Plan
Where did this measure come from?	Event, workshop, report, etc. that first raised the policy measure
Type of policy stakeholder(s) who raised the policy measure?	Policy professional, active stakeholder, interest citizen who raised the policy measure and type of professional (consultant, academic, campaigner, policy officer, et.c)
Type of knowledge utilised to formulate policy measure?	Specialist or tacit knowledge

The documentary analysis method allows the research to investigate the co-productive policy development processing archival data from a different subjective perspective than the other research methods. The documentary analysis's distinct perspective enables this method to evaluate the process's implications through a different lens, adding robustness to the research's analysis. The documentary analysis method particularly supports the analysis of the consequences and limits of the process. In combination with the other research methods, the documentary analysis method enables this research to evaluate how the co-productive urban policy development process legitimised the contributions of individual stakeholders that resulted in the specific policy measures formalised in the policy documents.

4.6 Data analysis

This research reaches meaningful findings through its data analysis approach. The primary lens I utilise for the data analysis is a thematic qualitative analysis approach. The thematic qualitative analysis focuses on examining and analysing qualitative patterns of behaviour and attitudes through interpreting meaning from the data (Attride-Stirling 2001). Thematic qualitative analysis allows data for all four methods to be discursively evaluated, enabling the data analysis to undercover meaning and new understandings (Attride-Stirling 2001). Although

thematic qualitative analysis is the overarching analytical approach for the research, there were distinctions between the analysis of each research method and their data sets. Each research method's data were analysed using a slightly different framework. For example, some methods like the documentary analysis produced rigid data in an analytical tool that required less interpretation to evaluate (Mogalakwe 2009). Meanwhile, other methods, such as participative observation, produced descriptive data that required more sophisticated iterative interrogation to evaluate meaning within its higher degree of abstraction. The data from each research method was analysed when the method's data collection period in the field had been completed.

The thematic qualitative analysis revolved around the key themes identified in the literature related to co-productive urban climate policy development that were evaluated in Chapters 2 and 3. Although thematic qualitative analysis is a subjective endeavour, it is a rigorous analytical choice so long as subjective decisions are articulated, justified, and consistent (Jonsen & Jehn 2009). Additionally, the data analysis approach reduces the risk of overly relying on my single subjective perspective through the embedded research position by using research methods that cultivated data from different sources, triangulating the analysis across independent perspectives (Jonsen & Jehn 2009). Triangulating across the research methods through this data analysis approach juxtaposes my positionality that emanates most strongly from the participative observation method against the stakeholders' positionalities through, for instance, the sequential informant interview method (Jonsen & Jehn 2009).

The participative observation and sequential informant interview methods were analysed through a systematic process of qualitative thematic coding. Field notes from the participative observation method and transcripts from the sequential informant interview method underwent the first level of analytical coding based on the themes identified in the literature (see Figures 2 and 3). These themes from the literature were also the foundation of the semi-structured interview guides. Each instance a theme was identified within the data during the first-level analysis, the corresponding data were assigned a coded (Campbell et al. 2013). After each field note and interview transcript underwent an initial level of coding, the derived codes were separately collated onto master code lists. Each master list of codes then underwent two more levels of analysis to consolidate and deduce the codes into more specific categories. Once each master list of codes could no longer be consolidated, there was a final list of codes for the participative observation and sequential informant interview data. The thematic coding process

enabled me to evaluate how essential themes from the theoretical framework took shape within the empirical research (Campbell et al. 2013).

The stakeholder participation analysis and documentary analysis research methods relied on a different data analysis process. These methods were assessed using structured analytical tools to evaluate their corresponding data. As explored in Chapter 4.2 and Chapter 4.4, both the stakeholder participation and documentary deconstruction tools organised the research data into categories within analytical spreadsheets. The categories determined for both analytical tools were selected based on the identifiability of the relevant data. This meant that every data category within these analytical tools had to represent a specific piece of information, such as the number of hours spent in official meetings or tangible interaction documented in the participative observation field notes. Once the analytical tools had been populated with data, I could then evaluate meaningful patterns and themes that emerged from them. These structured analytical tools that I developed and used to evaluate the stakeholder participation analysis and documentary analysis methods allowed for the spreadsheets to be flexibly created to assess meaningful data I was able to collect while maintaining methodological rigour by analysing common data sources such as field notes in a standardised approach (Campbell et al. 2013).

Finally, I reflected on my role in this study through the embedded research position as an active intermediary. To evaluate my impact within the co-productive climate policy development process, I used Williams' integrated evaluation framework — commissioned by this research's funder (Williams 2017). This framework was developed to analyse the effects and influences of researchers working in embedded spaces with different communities on integrating co-production processes (see Figure 10). This research has centred on analysing co-productive urban climate policy development through an active embedded approach, so the integrated evaluation framework has been an appropriate analytical approach to examine the procedural impact and influence I contributed through the embedded research position (Williams 2017). The integrated evaluation framework primarily analyses the effect I had within the policy development process itself rather than the particular outcomes policy outcomes that may have resulted from my actions in the embedded research position (Williams 2017). I use the analysis from the integrated evaluation framework in Chapter 8 to assess the influence I had upon the co-productive policy development process through the embedded research position and consider my effect's broader implications for this research's analysis.

Figure 10. Integrated evaluation framework: Effects and influences of researchers in embedded spaces

Orders of Effect	Categories of Effect		
1	*Usable Products* - Technologies and social innovations - Publications - Distribution of knowledge	*Enhanced Individual Capacity* - Acquired knowledge (individual or collective; systems/process) - Personal change - Decision making capacity	*Network Effects* - Networks created or expanded - Community trust created or expanded - Community identity
2	*Policy Effects* - Policies/decisions made - New evidence and actors included in policy decisions - Solutions implemented	*Organizational Changes and Action* - Changed context for new and ongoing work - New organizations and business models - Change in decision making processes	
3	*Alternative Visions and Imaginaries* - Shifts in public narrative - Collective purpose and vision - Greater social cohesion across groups	*Transformed Social Practices* - Norm change and/or adoption - Inclusion of new actors and issues in public spaces and discourse - New space for innovation and experimentation	

The thematic qualitative analysis approach allowed me to draw upon this study's thick qualitative richness while preserving critical rigour. The embedded research approach enabled this study to collect a significant amount of high-quality qualitative data through the four research methods. Thematic qualitative analysis was an effective analytical approach that has enabled me to explore the full breadth and depth of that data through a systematic interrogation process. The data analysis approach's outcomes have led to learning evaluated in the following empirical chapters of this thesis and elucidated new understandings.

4.7 Research ethics & integrity

This research had potential ethical conflicts that I carefully considered and mitigated against. The salient concepts at the centre of this research — urban climate policy development and co-production — are politically and socially fraught subject matters. Urban climate policy development is a highly complex policy sphere involving diverse stakeholders with various interests that can clash. Meanwhile, co-production is fundamentally concerned with creating new distributions of power, resources, and knowledge, inviting a potentially radical departure from traditional forms of governance. Evaluating urban climate policy development or co-production through a traditional research approach has the potential to be ethically

complicated, but this study has added the further complicating layer of embeddedness. The active dimension of the embedded research position required me to spend a great deal of thought before the research began — and in the field — planning how I would avoid ethically compromising situations and consider how I would negotiate these instances. In this final section of the chapter, I will explore what potential ethically compromising scenarios I envisioned might occur and examine the protocols developed to negotiate them while maintaining a high standard of research practices.

It was important to establish ethical boundaries in the relationships between myself, the GMCA Environment Team, and the University of Sheffield before entering the field through the embedded research position. To set these ethical boundaries, I led numerous discussions with my academic supervisor, and the GMCA Director of Environment beginning in October 2017 and at multiple stages during the research. These discussions were codified in two Memorandum of Understandings that formalised our commitment to preserving the highest possible ethical standard throughout this research. We determined what activities would be appropriate for me to engage in through the embedded research position (see Chapter 4.5.1). As an embedded PhD researcher, I had responsibilities within the 5-Year Environment Plan's development process that gave me some power and autonomy. Formalising how I would use this power within the Memorandum of Understandings — and be ring-fenced from others' power — was an essential component for maintaining strong ethical principles throughout this research.

In addition to negotiating the activities I would support, we also outlined the ethical principles that would guide my work. This research's main ethical principle was to do no harm to the individuals involved in the 5-Year Environment Plan's development process, in accordance with the University of Sheffield's ‘Good Research & Innovation Practices Policy’. To ensure no harm was done, I relied on a relationship-based form of research ethics that revolved around dialogue with research participants (Banks et al. 2013). This form of ethics was achieved by explicitly articulating to the stakeholders that I was collecting fieldwork data on our interaction and discussing how the interaction would be represented while providing them with protection through anonymity, except in a few specific cases where the stakeholder was asked if their title or organisation could be revealed because of its relevance to the research (Banks et al. 2013). This relationship-based form of ethics was crucial for maintaining rigorous ethical standards in a dynamic, complex fieldwork setting.

There were two likely potential scenarios that presented ethical concerns for the research that I proactively developed a plan to mitigate against from the outset of entering the field. The first of which was my personal climate ideology conflicting with the GMCA Environment Team's work that I was expected to deliver. I was supposed to support and facilitate co-productive policy development activities in with the GMCA Environment Team through the embedded research position. There was a possibility that the GMCA Environment Team would advocate for a particular climate policy measure that I would be positioned to defend or rationalise during activities within my role in the embedded research position. If this scenario arose, I determined with the GMCA Environment Team that I would attempt to articulate the GMCA's position but make my personal contrasting views clear (Participative Observation Field Note, 20 November 2017).

The second potential fieldwork scenario that would present ethical challenges was the possibility that my role as an 'animator of co-production' would position me at the centre of radical policy contestations. Co-production has the potential to support robust policy negotiations by bringing non-traditional, radical ideas into the policy development process. By designing and facilitating co-productive policy development activities, there was a possibility I would be placed at the centre of contentious policy negotiations that would be ethically challenging to navigate. If this situation were to develop, I agreed with the GMCA Environment Team that I would act as an independent negotiator (Participative Observation Field Note, 20 November 2017). This approach would give the co-productive policy development pathways the ability to support meaningful negotiation and provide me with fieldwork data while not acting as a representative of the GMCA Environment Team that might be included to lead the dialogue toward a particular outcome.

During this research, I took additional concrete steps to carefully traverse ethical challenges and facilitate the relationship-based form of ethics. First, all of the individuals I came into contact with during fieldwork activities provide their informed consent before I collected any data from them. For most of these interactions, I verbally provided the individual with information about the research project, explained how data would be collected and what would happen with their data. I would then ask the individual to provide verbal consent if they were comfortable being included in the research. There were no repercussions for individuals that did not provide consent to participate in the research. The smaller group of policy professionals

and active stakeholders studied most closely during the fieldwork activities were provided with an information sheet about the research and asked to provide their verbal consent (see Annex 4). Finally, the policy professionals and active stakeholders who participated in sequential informant interviews were given a written participant information sheet and asked to sign a written consent form (see Annex 5). Every individual who participated in any fieldwork activity provided a degree of informed consent appropriate with their corresponding level of involvement in the research.

Second, individuals who participated in this research were explicitly given the expectation that their specific views and quotes would be anonymised as much as possible. I have redacted participating individuals' identities wherever possible in this thesis by assigning them participant codes (e.g. Participant 1). Anonymised participant codes were used because it was the only way to provide the participating individuals with meaningful anonymity, given much of the data used in this thesis was gathered through the embedded research position where all of the individuals were known by one another. Using participant codes to anonymise the individuals' identity does not hinder the learning presented in this thesis because, in most instances, the specific piece of data being reflected has meaning irrespective of the identity of the individual. The only exception to this anonymity protocol was in the rare case that an individual's professional background was contextually significant to the data being presented. In these instances, the individual was asked if they would provide additional verbal consent for their organisation or job title to be identified in connection to the corresponding data being presented. These anonymity procedures ensured that every participating individual was provided meaningful anonymity without diminishing the research findings.

Third, I developed and utilised a contemplative reflexive praxis to ensure my actions throughout the embedded research position stayed within ethical boundaries. It can be challenging for an embedded researcher to delineate when an ethical boundary is at risk of being crossed without a clear reflexive praxis (Coghlan 2007; Guillemin & Gillam 2004). Therefore, I utilised the reflexive section of the participative observation field notes to reflect on why I undertook particular activities through the embedded research position and how those specific actions mapped onto my responsibilities as articulated within the Memorandums of Understanding. This consistent reflective practice enabled me to engage in actions through the embedded research position while remaining vigilant of the role's ethical borders. However, when I identified my actions approaching an ethical boundary of the embedded research

position, I had an additional layer within my reflexive praxis. In these instances, I sought advice from my academic supervisor and used their external perspective to determine a responsible path forward. This process of deliberating with my academic supervisor helped me focus on what could be a blurry ethical line. By exercising this reflexive praxis, I protected against my actions during the embedded research position deviated beyond any ethical boundary.

I was able to draw on several aspects of my positionality that were similar with the GMCA Environment Team policy officers I engaged with to quickly establish and build upon this research's relationship-based form of ethics. For example, the identity and history dimensions of my position largely overlapped with the policy officers (England 1994). We shared middle-class, highly educated backgrounds and similar professional statuses as white-collar workers in the knowledge economy. I also shared the language aspect of my positionality with the policy officers being a native English speaker formally trained in climate science and urban planning with a background in local government policymaking (England 1994). Lastly, as a Caucasian, cisgender male, the ethnicity and sex dimensions of my positionality were closely related to policy officers (England 1994). These common elements of my positionality that were shared with many of the GMCA Environment Team policy officers enabled me to employ a relationship-based form of ethics during this research and fully leverage the embedded research position, which is explored in depth throughout Chapter 8 (Bourke 2014; Banks et al. 2013). Furthermore, these shared dimensions of positionality may have impacted the research by increasing my ability to gather data because GMCA Environment Team policy officers likely had their guard down when I was in their presence as I was subconsciously perceived as a colleague although that data may have also required more rigorous analysis to interpret as policy officers likely assumed I recognised subtleties within their activities they took for granted and thus would not have made explicit (England 1994; Bourke 2014).

Elements within my positionality also impacted the other individuals involved in this research in ways that were likely distinctly from GMCA Environment Team policy officers. For example, the identity and history elements of my positionality as a socio-culturally mobile American with an elite background as highly educate and middle-class likely rendered me an outsider in the eyes of many interested citizens I interacted with during the research (England 1994). The language dimension of my positionality was likely both shared and distinct with the various policy professionals and interested citizens I engaged with during the research (England 1994). For some stakeholders, my fluency utilising technical climate policy

vernacular likely contributed to my ability to establish trust quickly and gain access to rich data. However, for others the language dimension of my position as an individual not familiar with local parlances and a proclivity to discuss topics as a technocrat rather than layperson likely made the interested citizens I interacted with more guarded around me, requiring greater time and attention to establish trust. Finally, the ethnicity and sex aspects of my positionality would be perceived as highly conventional within the sphere of climate politics where white males are disproportionately represented (England 1994). For those individuals previously active in climate politics, these dimensions of my positionality may has impacted the research by positioning me as an insider while others may have viewed me as an outsider, someone with a propensity to be disinterested or unsympathetic to their interests. My positionality likely made a distinct impact on the non-GMCA Environment policy officers involved in this study and I utilised the relationship-based form of ethics to maintain awareness of how it may influence the research.

In addition to the measures I took to uphold ethical standards throughout this research, there was also significant forethought about research integrity that shaped this study. Following the University of Sheffield's 'Good Research & Innovation Practices Policy,' this study regarded research integrity as the commitment to "paying attention to detail at all stages (of the research) in order to ensure the accuracy and, therefore, the credibility of the data and results…" (University of Sheffield 2019, 6). It was crucial to this research that every aspect of the research design be carefully considered and scrutinised so that high quality, robust data could be gathered and analysed to generate results. This research collected data on a singular policy development process that was unique, meaning it is not possible to reproduce this study. Therefore, I developed the research methods to collect the data in a manner that would be transparent for those reviewing this research, giving readers a clear understanding of the methodological choices that I made and the reasons behind them.

In summary, this chapter has developed an overarching approach for investigating and evaluating the empirical research, building upon the conceptual framework. The basis of this chapter was to develop a methodologically robust approach for investigating the research's core concept as an embedded participant stimulating co-productive elements within that process while managing different relationships, interests and challenges throughout that process. To achieve this, the chapter has explored the empirical research's case study approach and synthesised the particular context that Greater Manchester was selected as the site for this

study. I then unpacked the research design that centred around the concept of embeddedness and the associated embedded research position. Next, I explored the fieldwork approach and the four research methods that were used to collect data. Lastly, I examined the data analysis approach and addressed how this research mitigated potential ethical challenges and proactively sought to preserve research integrity. This chapter has served as an important bridge linking the analysis of previous literature and theoretical knowledge with the empirical study that this research evaluates to contribute to collective scholarship. Having explored the research design, methodology and methods, the thesis now focuses on the empirical research.

5. The GM Five-Year Environment Plan's development process: Interests, stakeholders, struggles & outcomes

At the beginning of the thesis, I examined cities' critical role in developing ambitious policy action for society to avoid the current destructive climate change trajectory. The conceptual framework then explored the various form of urban climate policy and examined the weaknesses of conventional technocratic approaches that have not delivered action at the scale demanded by the crisis, particularly highlighting the inability of these approaches to contest and negotiate between the different existing perspectives. I then investigated co-production and examined the theoretical claims that have been made of the concept to consider how it might support urban climate policy development. The conceptual framework then synthesised a model that considered how co-productive approaches may surmount the deficiencies of conventional approaches, creating the possibility for novel policy outcomes. The thesis then developed an approach for exploring the conceptual framework in an empirical. As established in Chapter 1, this study's objectives were to develop a framework for analysing co-productive urban climate policy development and to evaluate the implications of that mode of climate decision-making in an applied setting. As summarised, the first section of the thesis has fulfilled the study's first research objective. The following chapters will now evaluate the empirical case study of Greater Manchester and its process of developing the 5-Year Environment Plan through an explicitly co-productive approach. In doing so, this empirical section seeks to fulfilled the study's second primary research objective.

Chapter 5 evaluates the complex process of developing and launching the *Greater Manchester 5-Year Environment Plan* using the embedded research position within the GMCA Environment Team. I analyse this policy development process primarily with the data I collected through the embedded research position. The empirical research's embedded position enabled me to probe and generate insights within the highly contentious, entangled terrain of attempting to utilise co-production as an approach for developing climate policy. Therefore, this initial empirical chapter investigates the 5-Year Environment Plan's development process from 'behind the veil' as an embedded researcher alongside those engaged in the process. The analysis in Chapter 5 examines the process of developing the 5-Year Environment Plan over two years — evaluating the interests, stakeholders, challenges, and outcomes that manifest throughout the process. Through its analysis, the chapter specifically seeks to develop insights that respond to the study's first research questions – *how is co-productive urban climate policy development understood and applied by different stakeholders involved in a co-productive policy development process?*

This chapter contributes to the thesis by evaluating how co-production as a climate policy development approach can be applied and understood in an empirical institutional setting. To begin, the chapter examines the historical political context that the policy development process this research investigates emerged from and explores the environmental governance apparatus of Greater Manchester. The chapter then analyses the full course of the 5-Year Environment Plan's development process — from inception through formal adoption — and evaluates the challenges, opportunities, and limitations of co-production throughout. Through its analysis, this chapter makes a notable contribution to the thesis by constructing an in-depth evaluation of co-productive urban policy development as it was facilitated in one particular setting. The chapter's findings demonstrate that while the 5-Year Environment Plan did realise some of the claims made of co-production as assessed in the conceptual framework, in practice, co-productive urban climate policy development encountered some of the same challenges as conventional approaches.

5.1 Context: Climate governance in Greater Manchester

Greater Manchester has a strong political identity rooted in its rise from an old market town into the world's first industrial metropolis during the Industrial Revolution. Due to Greater Manchester's strategically developed canal transportation networks, early innovation and adoption of new technologies, proximity to productive coal mines, and its cool, damp climate, the city and surrounding area was an ideal location with competitive advantages to support a burgeoning cotton and textile manufacturing industry with 52 textile mills by 1802, one of the largest such urbanising industrial hubs of the time (Marcus 2001). The region's economic boom during the Industrial Revolution was anchored in Manchester as the central point for trade and political influence, though the surrounding communities also experienced rapid industrial expansion developing their own particular socio-political identities.

From the Industrial Revolution beginning in the 18th century through the 1960's, Greater Manchester experienced a dramatic transformation from a booming industrialised powerhouse to an economically hollowed shell of its former self. During this period, Greater Manchester became prominent within the UK as a significant cultural and political leader. Greater Manchester developed a reputation as a socially and politically vibrant area marked by numerous catalysing events such as the Peterloo Massacre of protesters demanding reforms to

parliamentary representation, the establishment of the first labour union organised through Trade Union Congress and a lightning rod of the Suffragette Movement among others phenomenon (Marcus 2015). This historical period has left Manchester and the surrounding areas with a strong local identity that remains present.

Since the 1960's, local government reform has been a topic of wide discussion in the UK. On 11 June 1969, the UK parliament published the Redcliffe-Maude Report of the Royal Commission on Local Government in England 1966-1969 (Jones 1973). The Labour Government who was in power commissioned the report to reconsider the structure of local government in England and propose recommendations for reformed local authority areas based upon their size and character with the aspiration of revitalising local governance (Jones 1973). To determine the boundaries of proposed local authority areas, the commission considered the interdependencies and densities of regions, examining factors such as the provision of key services, travel to work and the pattern of newspaper circulation (Jones 1973). One of the report's proposed new metropolitan areas was south east Lancashire, north east and central Cheshire (Selnec), the loose geographic outline for what has since become known as Greater Manchester (Jones 1973). The Redcliffe-Maude Report was accepted by the Labour Government following its publishing, though it was rejected quickly dismissed by the new Conservative Government following the 1970 election (Jones 1973).

In the lead up to the 1970 election, part of the Conservative's electoral agenda was to create a two-tiered system of metropolitan and non-metropolitan local government (Jones 1973). After winning the election, the Conversative Government used some of the Redcliffe-Maude Report's findings to develop a new local government system established in the Local Government Act 1972 (Jones 1973). Among the Act's outcomes was the metropolitan county model of local government and a Boundary Commission to divide England into districts (Jones 1973). The Local Government Act 1972 formally established Greater Manchester with boundaries consistent with those of the Selnec area (Jones 1973; Deas 2014). Greater Manchester, as officially established on 1 April 1974, constituted ten metropolitan districts – Bury, Bolton, Manchester, Oldham, Rochdale, Salford, Stockport, Tameside, Trafford and Wigan. At this time, the Greater Manchester County Council was established as a local administrative body with responsibilities for roads, master planning, waste disposal, public transportation and emergency services (Deas 2014). The Greater Manchester County Council

shared power with the ten district level councils, each with their own responsibilities (Deas 2014).

A decade after it was established, the Labour controlled Greater Manchester County Council was abolished through the Local Government Act 1985 (Deas 2014). The Greater Manchester County Council - and other metropolitan county councils around the country - had numerous disputes with the Conservative Thatcher Government, which led to the dismantling of this new system of local government. Following its abolition on 31 March 1986, most of the Greater Manchester County Council's responsibilities were devolved to the ten district level councils (Deas 2014). While no legally mandated city-regional agencies remained, the ten district level councils agreed to voluntarily establish the Association of Greater Manchester Authorities to act as a joint board to coordinate and govern specific responsibilities that had not been devolved (Deas, Haughton & Ward 2020).

Following the 2008 economic recession, the Association of Greater Manchester Authorities submitted a bid to parliament that evaluated the potential benefits of creating a Statutory City Region, which, if agreed to by the ten district level councils, would allow Greater Manchester's local authorities to pool their resources and create a 'Combined Authority' (GMCA) with certain powers over strategic planning, housing, waste management, skills, public transport and carbon neutrality (Deas, Haughton & Ward 2020). Shortly thereafter, the Local Democracy Economic Development and Construction Act 2009 was approved by parliament and effectively endorsed the Association of Greater Manchester Authorities' bid to parliament (Deas, Haughton & Ward 2020). This led to a consultation of the ten district level councils to determine how a 'Greater Manchester Combined Authority' would be created based on the approved bid (Deas, Haughton & Ward 2020). The outcomes of the consultation were then negotiated with the UK central Government, leading to the establishment of the GMCA on 1 April 2011 and Greater Manchester City Deal 2012 (Deas, Haughton & Ward 2020).

Through its City Deal with Government, GMCA gained devolved resources, powers and governance structure to support the city-region's development. While the ten district level councils retain many of their powers, the City Deal gave GMCA specific authority and responsibilities in the areas of strategic investment, housing, transportation, skills and low carbon sector development (Deas, Haughton & Ward 2020). It was determined that the GMCA would be led by the leaders of the ten district level councils and a newly created directly elected

Metro Mayor with the position's first three-year term to be voted upon on 4 May 2017. These eleven individuals make policy and strategic decisions for GMCA through a simple majority voting process (Deas, Haughton & Ward 2020).

In the realm of low carbon sector development, Greater Manchester's City Deal stipulated that GMCA must "establish a Low Carbon Hub, with a plan to reduce carbon emissions by 28% by 2020" (Greater Manchester City Deal 2012, 4). The Greater Manchester Low Carbon Hub (GMLCH) was designed to be a quasi-independent governance institution, deeply linked with GMCA but primarily represented by members from local universities and large public, private and third sector organisations. The GMLCH was designed to convene a board representing major organisations from across the city-region, accountable to GMCA, though not responsible for formal policy development (Participant 1, personal communication). The GMLCH was created to make recommendations that GMCA could reject or approve with agreed decisions coordinated by the GMCA's Environment Team and supported by the GMLCH (Participant 3, personal communication).

When agreed in 2012, the City Deal determined a 2020 carbon emissions reduction target for GMLCH to support that was aligned with the UK's national Climate Change Act 2008. The Climate Change Act aimed to position the UK to become a low-carbon economy, reducing national carbon emission 80% below a 1990 baseline by 2050 (Marsden et al. 2014). The Climate Change Act's target was intended to be met through a mix of national level policy actions and policy measures implemented by local government organisations. Local government organisations could voluntarily develop more ambitious climate policies than the nation target, though they needed to adhere to the Climate Change Act as a baseline (Marsden et al. 2014). As examined in Chapter 2, local government organisations cannot achieve climate action independently, and the GMLCH was, in part, created to enable GMCA to develop and implement climate policy in collaboration with prominent organisations in the city-region (see Bulkeley et al. 2009; Castan Broto 2017).

The GMLCH was, to a degree, inspired by a climate governance process that took place at the local authority level in Manchester. In 2005, Manchester: Knowledge Capital, a strategic partnership led by Manchester City Council to drive innovation and economic transformation, initiated a feasibility study to map the city's capability to support a green energy revolution in response to climate change (Manchester: Knowledge Capital 2007). The feasibility study

brought together a consortium of organisations that agreed to expand on their research through the city-wide climate change initiative 'Manchester is My Planet' (Manchester: Knowledge Capital 2007). The Manchester is My Planet pledge drive launched in August 2005 and sought pledges from individuals and organisations to commit to doing "my part in reducing Manchester's greenhouse gas emissions by 20% before 2010, to help the UK meet its international commitment on climate change" (Manchester: Knowledge Capital 2007). After the pledge campaign was deemed successful, Manchester City Council developed a new governance body Manchester: A Certain Future (MACF), to help the city embed low carbon cultural change in practices and oversee the delivery of Manchester's first climate strategy based off the learnings from Manchester is My Planet programme (Knox 217). MACF was created in 2009 and a steering group was established in 2010, constituted by individuals representing influential organisations (Knox 2017).

It is important to explore this contextual background that this empirical research has taken place within. Although there have been inquiries of climate policy development at the Manchester scale of politics (see While, Jonas & Gibbs 2004; Evans & Karvonen 2014; MacKillop 2012; Hodson, Marvin & Bulkeley 2013), limited investigations have previously been conducted of climate policy development at the Greater Manchester level, particularly since the Metro Mayor position has been filled. The policy development process that this research evaluates takes place within a dynamic context that follows the establishment of GMCA, a Metro Mayor position agreed through the City Deal with the UK Government. While GMCA has become a prominent institution since its establishment a decade ago, the climate governance context this empirical research takes place in a complex and has evolved over several decades.

5.2 Origins of the policy agenda

Andy Burnham — who would become the first directly elected Mayor of Greater Manchester — was selected as the Labour Party's candidate in August 2016 to run in the 2017 local election. Before running to become Mayor of Greater Manchester, Burnham served as a Member of Parliament representing Leigh in Wigan, one of the ten Local Authorities within Greater Manchester. In the lead up to the Greater Manchester mayoral election, Burnham hosted several pre-election hustings in December 2016 through February 2017. These events were

held with practitioners, activists, academics, and community organisers and helped shape several policy areas within his Mayoral Manifesto. Burnham's election team organised three of these meetings that focused specifically on the environment and climate change (Participant 1, personal communication). Burnham's election team solicited the social enterprise Cooler Projects who are affiliated with the charity Carbon Literacy Project to help plan and facilitate one of these events (Participant 1, personal communication). Another of Burnham's pre-election environmental and climate change meeting was hosted by SERA (Socialist Environment and Resources Association), the Labour Party's environmental campaigning organisation (Participant 2, personal communication). This event brought together scientific experts, activists, and educators to discuss climate change's various dimensions through facilitated workshop discussions (Participant 2, personal communication). Burnham attended this event but was positioned as the event's 'keynote-listener', listening to the conversations throughout the event and providing a final summary over what was discussed (Participant 2, personal communication). An individual who participated in the SERA event reflected,

> "The fact that he (Andy Burnham) was willing to come along, listen to experts, and those of us with major concerns showed his commitment to the issue. Whether his presence was a declaration of being an ally or just him wanting to listen to what people had to say was meaningful to me."
> — Participant 2, personal communication

These pre-election hustings were explicitly intended to shape Burnham's election manifesto. However, several individuals who participated in these events reflected that no consensus position or clear range of views emerged from these events that could be endorsed within an election manifesto (Participant 1, personal communication; Participant 3, personal communication). The only area where a consensus was reached between participants at these three pre-election environmental hustings was the recognition that the city-region needed to take more urgent, ambitious action addressing climate change beyond the carbon emissions reduction target set out in Greater Manchester's City Deal (Participant 3, personal communication). Following the hustings, Burnham's Mayoral Manifesto proposed to continue the public deliberation process on how accelerating climate action could be achieved by purposing to "…host a Mayor's Green Summit to declare a new, accelerated ambition for Greater Manchester on the green economy and carbon-neutrality. In the meantime, we will ask experts and city stakeholders to lead a public debate on what that new goal should be"

(Burnham for Mayor 2017, 7). While the pre-election hustings did not lead to a specific, detailed climate policy proposal, they did formally codify Burnham's commitment to ensuring Greater Manchester's local climate policy would be informed by public sentiments and the most rigorous scientific evidence.

After Andy Burnham won the Greater Manchester Mayoral election, senior officers in GMCA's Policy and Strategy Directorate evaluated the mayor-elect's manifesto to assign individual teams responsible for delivering specific areas of the mayor's manifesto commitments (Participant 4, personal communication). It was determined internally within GMCA that the Environment Team would be responsible for delivering the Green Summit and developing a plan for accelerating the city-region's carbon neutrality ambitions (Participant 4, personal communication). After this administrative decision had been made, the GMCA Environment began working with Councillor Alex Ganotis, the Leader of Stockport Council and Green City-Region Portfolio Lead (Participant 4, personal communication). Councillor Ganotis was involved to provide political oversight and leadership, ensuring the process would effectively deliver the mayor's manifesto commitment (Participant 4, personal communication).

In May and June of 2017, immediately after the GMCA Environment Team had been assigned the responsibility to organise and deliver the Mayor's Green Summit and associated policy initiatives, policy officers within the Environment Team had numerous informal conversations with individuals from a range of external organisations (Participant 4, personal communication). Through these discussions, the GMCA Environment Team policy officers sought to gather different perspectives about what the Green Summit might attempt to achieve and how the event would fit into a meaningful policy development process (Participant 4, personal communication). One key aspect these conversations explored was how the Green Summit event and associated policy development process could engage diverse stakeholders from across Greater Manchester in a manner that could potentially generate public ownership over an eventual strategy (Participant 4, personal communication; Participant 5, personal communication). Following these discussions, the GMCA Environment Team with the support of Councillor Ganotis determined that a *Green Summit Steering Group* (GSSG) — a governance body consisting of stakeholders from non-GMCA organisations — would be created to provide "advice and challenge" during the Green Summit event planning and policy decision-making processes (Participant 4, personal communication). Furthermore, the GSSG

was a governance innovation intended to help the GMCA Environment Team achieve public buy-in and ownership for the climate policy that would result from this process (Participant 5, personal communication).

The GSSG was a body within Greater Manchester's climate governance apparatus with no statutory role or resources and was established upon a loosely defined mandate. The group was not formally recognised by the GMCA or any local authorities within Greater Manchester. Furthermore, when the GSSG began, it had no official terms of reference formalising how it would support decision-making and policy development. Instead, the stakeholders who joined the GSSG did so on a non-binding voluntary basis and provided informal personal and professional capacity support (Participative Observation Field Note, 17 October 2017). The stakeholders who joined the GSSG did so with the expectation that the GMCA Environment Team, Councillor Ganotis, and the mayor would respect and consider the group's contributions (Participant 6, personal communication; Participant 7, personal communication). Despite the GSSG's ambiguous position and role within Greater Manchester's climate governance architecture, the group's members had little apprehension about the opaqueness surrounding the GSSG and entrusted GMCA policy officers would fairly respect the body. One member of the GSSG reflected this sentiment,

> "From the very outset, it was quite slim on details. There wasn't a great call or extensive brief that was provided to us…I think that the open approach we had was quite appropriate. You don't want to be consulted as a stakeholder; you want to be involved as a co-producer."
> — Participant 6, personal communication

Once the initial framework of the GSSG had been developed by the GMCA Environment Team and Councillor Ganotis, they sought and received the mayor's support and backing of the group (Participant 4, personal communication). Following this, the GMCA Environment Team approached individuals from various private, public, and third sector organisations to invite them to join the GSSG and attend the group's inaugural meeting on 15 September 2017. The GMCA Environment Team had previously interacted in different professional settings with the organisations invited to the GSSG (Participant 4, personal communication). In total, 27 individuals joined the GSSG after receiving an invitation.

Councillor Ganotis chaired the GSSG, and the GMCA Environment Team provided administrative support and bureaucratic capacity. The first GSSG meeting in September 2017 began by outlining the mayor's manifesto pledge meeting followed by a discussion about how the GSSG would oversee and support the delivery of the manifesto's ambitions (Green Summit Steering Group Action Notes, 15 September 2017). The discussion at this first GSSG meeting was broad and focused on articulating the Green Summit goals and how they might be achieved (Green Summit Steering Group Action Notes, 15 September 2017). There were many ideas discussed throughout this meeting, but no formal decisions about how the process would transpire were made (Green Summit Steering Group Action Notes, 15 September 2017). Rather, the meeting concluded with the GSSG members agreeing to participate in monthly meetings that would provide advice, challenge, and support on a range of issues such as determining the scale of the Green Summit event, how democratic participation before the Green Summit might take place and advising how 'non-traditional' stakeholders could be engaged before and at the Green Summit (Green Summit Steering Group Action Notes, 15 September 2017). This first GSSG member, while reach no firm conclusions, was an initial step in building a collaborative ethos between the GMCA Environment Team and key stakeholders that would be built upon throughout the climate policy development process.

The conceptual origins of Green Summit process, and development of what would become the 5-Year Environment Plan, are important to unpack. The mayor's lack of a deep-seeded climate policy ideology and willingness to be led by others created spaces for civic participation and engagement and supported the ambition for a democratic policy development process. This political starting point created the possibility for the GSSG to impact climate policy development in partnership with the GMCA Environment Team. Furthermore, the Green Summit and GSSG's ambition to meaningfully engage non-traditional stakeholders and citizens through the city-region in climate policy development supported the possibility of the process facilitating a co-productive ethos. This early stage of the process highlights the mayor's explicit aspiration to broaden the scope of climate policy development beyond the traditional confines of the GMCA Environment Team to a wide constellation of stakeholders throughout the city-region in an inclusive, collaborative process.

5.3 The moulding of co-productive policy development

Shortly after the first GSSG meeting, I formally entered the policy development process as a participant through the embedded research position. As examined in Chapter 4.4, I engaged in this research through the embedded research position formalised between the Greater Manchester Low Carbon Hub and the University of Sheffield and my role was designed to build capacity to facilitate co-productive policy development with the GMCA Environment Team (see Annex 6). I began the embedded research position in late September 2017, coinciding with the policy development process's initial stage (see Figure 11). When I entered the field, the GMCA Director of Environment, my University of Sheffield academic supervisor, and I jointly determined that I would begin the embedded research position by spending two to three days per week in the GMCA Environment Team (see Annex 6). We agreed that during my initial phase in the GMCA office, I would undertake background research on the GMCA and the local policy context, conduct relevant theoretical evaluation for the PhD, and develop traction and legitimacy with the stakeholders who would be involved in the policy development process by being physically present in the organisation (see Annex 6). This intentional process of embedding in the GMCA Environment Team and the wider policy context was a crucial component of the embedded research position that enabled me to develop a theoretical foundation for the PhD that could be evaluated and investigated throughout the research.

The GSSG held its second meeting on 17 October 2017. This was also the first GSSG meeting where I was present and participated. During this meeting, two main discourses emerged that had ongoing significance throughout the nearly two-year policy development process. The first was a debate around what the GMCA Environment Team envisioned inclusiveness and openness would mean for the policy development process and the aspiration for the scale of the public engagement that should take place (Participative Observation Field Note, 17 October 2017). One agenda item at this second meeting was to discuss how citizens and the public would be engaged and what the purpose of that engagement should be (Participative Observation Field Note, 17 October 2017). During this GSSG meeting, numerous GSSG members expressed the importance to be intentional and deliberate from this early stage of the process about what public engagement actually might entail, how the public should be engaged during the policy development process, and how public input might be utilised during the policy development process (Participative Observation Field Note, 17 October 2017). These two emergent discourses - and the questions they prompted - continued to be mulled over

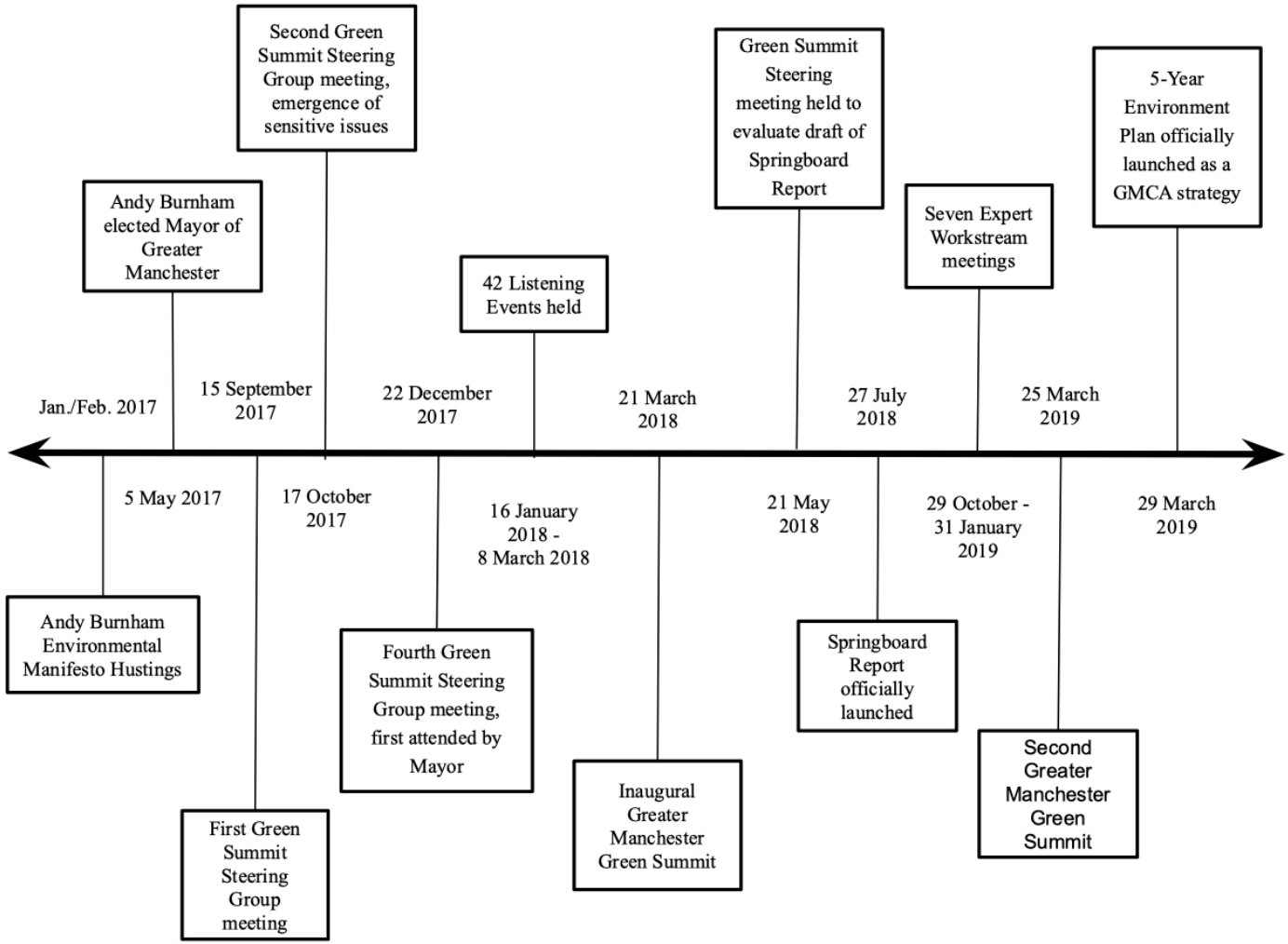
throughout the policy development process. One GSSG member noted these ongoing challenges stating,

> "From early on in the process, I felt we needed to be really clear about whether or not this was going to be a transparent and open approach to policymaking. Are we truly starting with a pretty blank sheet of paper and getting people to help us colour on it? Or is this a process about consulting people on a draft policy that's already been developed by the experts?"
> —Participant 8, personal communication

There was a tension that surrounded the purpose and scope of public engagement that persisted throughout the policy development process. However, as one GSSG member expressed during an interview, the mere fact these questions were articulated and frequently discussed was a positive development (Participant 9, personal communication). This forced the GMCA Environment Team to think deeply about the meaning of public engagement and confront how the citizens and non-traditional stakeholders could actively participate in the policy development process as informed contributors, not merely be consulted passively (Participant 9, personal communication).

The second ongoing challenge that arose during this GSSG meeting was ambiguity surrounding how contentious issues would be deliberated within this informal decision-making body. A city-region carbon footprint analysis and emissions reduction modelling tool called SCATTER was developed to support this policy development process by consultants to help policymakers understand the impacts of different policy options on the city-region's carbon footprint. During the October 2017 GSSG meeting, the director of the consulting firm Anthesis Group who was tasked with developing the SCATTER model presented a rudimentary version of the tool and explained the data variables that the algorithm used to determine the city-regions carbon footprint (Green Summit Steering Group Action Notes, 17 October 2017). Emissions from the Manchester Airport were not included in the model's initial version (Participative Observation Field Note, 17 October 2017)

Figure 11. 5-Year Environment Plan Development Timeline



Serval GSSG members argued that as a significant source of carbon emissions for the city-region, the airport needed to be included within the SCATTER tool (Participative Observation Field Note, 17 October 2017). The Anthesis Group director told the group adding the airport's emissions would be technically feasible but provided rationale as to why those emissions had been omitted (Participative Observation Field Note, 17 October 2017). The GMCA Director of Environment then proposed that the GSSG discuss the airport and other "sensitive issues" that were beginning to emerge later in the policy development process (Green Summit Steering Group Action Notes, 17 October 2017).

The phrase "sensitive issues" emerged from this meeting and was used by GMCA policy officers to deflect from politically contentious issues throughout the policy development process. There were several frequently raised sensitive issues such as Manchester Airport's £1B expansion plan, the Greater Manchester Pension Fund's nearly £2B fossil fuel investment, and Greater Manchester Spatial Framework Green Belt Assessment, amongst others. While GSSG members frequently discussed all of these sensitive issues, they ultimately were unaddressed in the final policy document (see Chapter 7.2). While there was never an explicit, formal deliberation process about these contentious issues, they were acknowledged repeatedly during GSSG activities and other co-productive pathways discussed later in this chapter. One GSSG member discussed this development in an interview stating,

> "There was a realisation from everyone in the (Green Summit) Steering Group, *"Name Redacted"* in particular, that these challenging issues have to be addressed. There were even pragmatists who typically avoid conflict that understood we can't continue to be silent on these issues — it's simply not tenable."
> — Participant 7, personal communication

Throughout this policy development process, sensitive issues continued to be raised and subsequently tabled for debate at some later point, which inevitably never arrived. Chapter 7.2 analyses how the co-productive process impacted how these contentious issues were conceptualised and understood.

During this October 2017 GSSG meeting, there was also a discussion about how 'the public' would be engaged in a discussion around climate change in the lead up to the Green Summit. Following Burnham's mayoral election, he expressed his desire for the Green Summit to be

used as an opportunity to stimulate "bottom-up environmental governance" and was "open for new policy ideas to be generated by citizens through the Green Summit" process (Participative Observation Field Note, 17 October 2017). To achieve this aim of citizens supporting the policy agenda setting process, the GMCA Director of Environment proposed creating an online survey around a set of undefined questions and holding a small number of 'listening events' to gather data from stakeholder groups. These public engagement pathways were proposed at this stage in the process, and the GSSG agreed to have thorough discussions to flesh out these ideas over the coming months (Green Summit Steering Group Action Notes, 17 October 2017). Lastly, it was agreed towards the end of the meeting that the Environment Agency would take the lead on developing ideas for the online survey and that Quantum Strategy & Technology — an independent environmental consultancy contracted by GMCA to support the delivery of Green Summit — and I as an embedded researcher would start developing a strategy for the listening events (Green Summit Steering Group Action Notes, 17 October 2017).

Over the next several weeks, I worked closely with Quantum Strategy & Technology to develop a coherent approach for the listening events. Quantum Strategy & Technology was contracted as a consultant to support the planning and delivery of the Green Summit. As part of Quantum Strategy & Technology's contract with the GMCA, they were tasked with facilitating six listening events with key stakeholders (Participant 9, personal communication). Neither the GMCA Director of Environment nor the GSSG gave Quantum Strategy & Technology or me a defined framework for what the listening events should attempt to achieve, who might be targeted, and how they might be structured (Participative Observation Field Note, 23 November 2017). Instead, Quantum Strategy & Technology and I were given a wide degree of latitude for planning the listening events — despite not being provided any resources or support — and several weeks discussing what these events might try to achieve within our constraints (Participative Observation Field Note, 20 November 2017). This loose structure encouraged Quantum Strategy & Technology and me to be creative and develop a proposal for the listening events to deliver and support the Green Summit's ambition.

Through back and forth discussions between Quantum Strategy & Technology and me, we agreed to present the listening events to the GSSG as a mechanism that could help to achieve the mayor's ideal aspiration of bottom-up environmental governance led by citizens, not just predetermined key stakeholder groups (Participative Observation Field Note, 20 November 2017). Quantum Strategy & Technology and I also agreed that the listening events should be

presented as a mechanism for engaging diverse audiences across the city-region by first sharing what the SCATTER tool highlighted as the city-region's key carbon emissions challenges and opportunities were (Participative Observation Field Note, 20 November 2017). Quantum Strategy & Technology and I then thought the listening events should openly ask what the participants wanted their future local environment to look like and what carbon reduction measures they thought the city-region should be focused on (Participative Observation Field Note, 23 November 2017). Lastly, Quantum Strategy & Technology and I agreed that when we shared our concept with the GSSG, it was necessary to clarify the importance of being fully transparent with listening events attendees and describe what the policy development process would like and particularly how the listening events would support policy development. Quantum Strategy & Technology and I shared this loose framework for the listening events with the GMCA Director of Environment. Then, the three of us agreed to present the idea to the GSSG for their feedback.

The 22 December 2017 GSSG meeting — the fourth GSS meeting — was attended by the mayor. It was the only GSSG meeting out of a total of 18 meetings that he would attend. The mayor opened the meeting by articulating his ambition for the Green Summit process to be a new policy-making forum where new policy ideas could percolate from citizens into the ratified policy (Green Summit Steering Group Action Note, 22 December 2017). At previous GSSG meetings, the GMCA Director of Environment spoke about the Green Summit's aspiration to be a meaningful event within a publicly inclusive policy development process but the mayor emphatically raising this notion added a new level of legitimacy to public participation, which was acknowledged as meaningful by several GSSG members. As one individual highlighted,

> "It also made a difference when Andy (Burnham) said during a Steering Group meeting that he wanted this process to build upon the views of citizens through a democratic process. I'd of course been hearing that from *the GMCA Director of Environment*, but when it came from Andy's lips that intention had a bit more gravitas. It's one thing when a policy officer says something, it's another when it comes from a political leader."
>
> — Participant 6, personal communication

After the mayor made these remarks, Quantum Strategy & Technology and I shared our proposal for the listening events with the GSSG. The GSSG had yet to provide detailed input regarding the content and structure of the listening events. After we shared our proposal, the GSSG supported our ideas (Participative Observation Field Note, 22 December 2017). I also shared that I had begun speaking with numerous different groups spread throughout Greater Manchester about hosting listening events and had already enrolled the Manchester Climate Change Agency Youth Board, Rochdale Council, Canon Burrows Primary School, North West Business Leadership Team, Manchester Arts & Sustainability Team, and Bury Council amongst others to host listening events. Having the mayor in the room, articulating his support for the listening events and engagement process leading to the Green Summit, provided important political credibility behind the discussions taking place in GSSG meetings (Green Summit Steering Group Action Note, 22 December 2017).

While the mayor's high-level political support for public engagement behind the scenes during the 22 December 2017 GSSG meeting was meaningful, there was a continuing debate amongst the GSSG about the specific role that public engagement would have in shaping the Green Summit and supporting policy development. During the next GSSG meeting on 12 January 2018, the online survey had been launched and already generated nearly 700 responses in just a two-week timeframe (Green Summit Steering Group Action Note, 12 January 2018). Simultaneously, eight listening events were already confirmed, with an additional 12 being discussed with host organisations (Green Summit Steering Group Action Note, 12 January 2018). The GMCA Director of Environment stated that he wanted to demonstrate at the Green Summit that the organisation was authentically utilising the public feedback generated through the online survey and listening event but forecasted that there would not enough time to fully organise and analyse that data in time for the Green Summit (Participative Observation Field Note, 12 January 2018). Therefore, a proposal was made by my academic supervisor — and member of the GSSG — to create a public participation reflection space at the Green Summit (Participative Observation Field Note, 12 January 2018). This space would enable the GMCA to visibly spotlight the range of public contributions that were being made through listening events and the online survey, allow Green Summit attendees to reflect on the public contributions, and "close the loop of engagement" to signal a new cycle within the policy development process (Participative Observation Field Note, 12 January 2018). The GSSG agreed that this idea could be a useful way to position the public's contributions, and there was an agreement for the University of Sheffield GSSG member to further the idea into a brief

white paper that would be discussed at the next GSSG meeting (Green Summit Steering Group Action Note, 12 January 2018).

Before the next GSSG meeting took place on 6 February 2018, a total of nine listening events had taken place, and over 1,200 individual responses to the online survey had been collected (Participative Observation Field Note, 5 February 2018). Over 500 individuals expressed a desire to attend the Green Summit, which was scheduled to take place just six weeks later, at a venue that was intended to have a capacity of 400 people (Participative Observation Field Note, 5 February 2018). This snowballing level of public engagement was far greater than what was initially anticipated by GMCA when the process began (Participant 5, personal communication). During this period of the Green Summit planning and policy development process, the GMCA Environment Team only consisted of two paid staff members (Participative Observation Field Note, 21 December 2017). As the process developed, the GMCA Director of Environment shifted the management approach for this team to ensure they could deliver what was required (Participant 4, personal communication).

When the 6 February 2018 GSSG meeting took place, the GMCA Environment Team was shrouded in this context of inundation and near over-saturation. Therefore, when my academic supervisor GSSG member presented their paper and proposal for the public engagement space at the Green Summit along with a delivery plan that did not require the GMCA Environment Team's capacity, it was well received by the GMCA Environment Team (Participative Observation Field Note, 6 February 2018). The GSSG members were generally receptive to this proposal to develop a '*breakout zone*' because it was uniquely seen as a co-productive space for organised public deliberation, something missing from the Green Summit agenda at this point (Participative Observation Field Note, 6 February 2018). While the GMCA Environment Team cautiously supported the breakout zone during the GSSG meeting, they said the idea could only be adopted if the GSSG provided the full capacity to implement the proposal (Participative Observation Field Note, 6 February 2018). It was unclear if the GMCA Environment Team wanted this breakout zone and could not dedicate resources toward it or only tacitly approved the idea and allowed it because an external organisation was responsible for delivering it.

However, it became clear in early 2018 that at the Green Summit scheduled for 21 March 2018, it would not be possible to formally and definitively "declare a new, accelerated ambition for

Greater Manchester on the green economy and carbon-neutrality" as was written in the mayor's manifesto. The GMCA Environment Team had commissioned the University of Manchester's Tyndall Centre for Climate Change Research to produce a report on the city-region 'carbon budget' and a carbon neutrality target date that was based on a "fair and equitable interpretation of the UK's Paris Climate Agreement commitment" (Participant 10, personal communication). It was determined in the Tyndall Centre report released in early March 2018 that the city-region's carbon neutrality target date should be 2038, with a total remaining carbon budget of 71 million tonnes (McLachlan 2018). The 10 Local Leaders and the mayor then had to deliberate whether or not to formally adopt the Tyndall Centre's targets and what carbon reduction policies they would co-sign (Participative Observation Field Note, 20 February 2018). To make a 'declaration' at the Green Summit as was intended, these deliberations would have to occur quickly.

The Local Leaders and Mayor were unable to agree upon a policy position in time for the 21 March 2018 Green Summit. It was determined that the political discussions would continue after the Green Summit, so a policy decision would hopefully be made. Despite the Local Leaders not agreeing upon a policy position, they did agree to underwrite the Green Summit's expanding costs, which totalled £118,000 (Participative Observation Field Note, 24 July 2018). The GSSG decided that in the absence of having an agreed policy position to tout, the headline message for the Green Summit should focus on the need for urgent accelerated action with the aspiration for Greater Manchester to be a carbon-neutral city region by 2038 (Green Summit Steering Group Action Note, 9 March 2018). While this outcome deviated from the group's original goal of formally declaring an accelerated carbon neutrality target with an associated policy pathway, it would enable the public feedback gathered through the Green Summit to influence the continuing policy development process.

The 21 March 2018 Green Summit took place at the Manchester Central Convention Complex, with over 700 individuals attending. The mayor opened the event, providing an overview of the day's agenda and highlighting the city-region's climate policy challenge (Participative Observation Field Note, 21 March 2018). Five speakers then gave provocations to the entire audience on a variety of topics. The audience was then split into three different groups and rotated between different event spaces: local successes & provocations, the breakout zone, and a networking lunch. After the Green Summit delegates had rotated through the three areas, the entire group was welcomed back into the main auditorium. This was followed by a series of

speakers and panel discussions. The event closed with a 'pledge session' where the mayor invited organisations to announce to the audience what carbon reduction actions they aimed to take in the future. Notably, there was no declaration from the mayor about specific policy measures that would be taken by GMCA as a result of the process that led up to the Green Summit (Participative Observation Field Note, 21 March 2018).

The most important outcome of the 2018 Green Summit from the mayor's perspective was articulating his ambition to take more significant urban action on climate change than what was currently taking place to make Greater Manchester a leading green city in Europe (On the Platform 2018). The mayor also announced that GMCA would attempt to stimulate accelerated local action on climate change by creating new partnerships like the Good Food Greater Manchester strategic food board, work with the UK Green Building Council to develop a cost effective programme for residential retrofit, and launch a #PlasticFreeGM campaign with the Greater Manchester tourism and hospitality sector to eradicate single use plastics (On the Platform 2018). The mayor used his 'soft-powers' as a convener in the city-region to create all of the announcements that were made at the Green Summit. He did not use the legal powers available to him to refranchise Greater Manchester's bus fleet and electrify the network, create a publicly owned Greater Manchester Energy Company to generate and store renewable energy or impose a passenger departure tax at the Manchester Airport — all ideas proposed by citizens through listening events and legally within the mayor's powers (Participative Observation Field Note, 9 March 2018). As no urban climate action plan or legally binding policies could be launched at the 2018 Green Summit, the Mayor announced that a second Green Summit would be held within one year to define a policy approach (On the Platform 2018).

5.4 Bounding policy contestations

Following the 2018 Green Summit, the GSSG met on 17 April 2018 to reflect on the Green Summit and discuss whether the GSSG would continue and in what form ahead of the announced second Green Summit. It was agreed that the GSSG should continue to support event planning ahead of the second Green Summit and that the group should play an increasing role in the policy development process as a "challenge and support" body that could represent broader perspectives from across the community (Green Summit Steering Group Action Note, 17 April 2018). Some individuals in the meeting expressed their desire to stay involved in the

GSSG but wanted a formalised assurance from the GMCA Director of Environment outlining how the group would support policy development ahead of the second Green Summit (Participative Observation Field Note, 17 April 2018). The GMCA Director of Environment agreed to produce a Terms of Reference for the GSSG, the first formal written document that outlined its purpose and position within GM's climate governance framework (Participative Observation Field Note, 17 April 2018).

The next GSSG meeting took place on 21 May 2018. The discussion focused on the *Greater Manchester Springboard to a Green City-Region Report* (Springboard Report) and developing 'thematic practitioner workstreams' (Green Summit Steering Group Action Notes, 21 May 2018). The Springboard Report was an official document being produced by GMCA that summarised the scoping process ahead of the first Green Summit along with GM's carbon-neutral policy priorities that were being developed into a formal policy — *Greater Manchester 5-Year Environment Plan* (5YEP) — that would be launched at the second Green Summit (21 May 2018 Green Summit Steering Group Action Notes). A crucial feature of the Springboard Report was its attempt to highlight GM's climate policy priorities by comparing the science-based finding of the SCATTER tool against the public feedback gathered through the listening events, online survey, and first Green Summit (Green Summit Steering Group Action Notes, 21 May 2018). The document also intended to bridge the mayor's campaign manifesto and a formal policy document to be launched at the second Green Summit (Participative Observation Field Notes, 7 June 2018). The GSSG decided that it was vital for GMCA to highlight in the Springboard Report the importance of public participation throughout the policy development process and to demonstrate the links between the public feedback with the policy priorities (Green Summit Steering Group Action Notes, 21 May 2018).

The GMCA Director of Environment described the thematic practitioner workstreams as a key mechanism for adding knowledge capacity during this next phase of the policy development process that would culminate at the second Green Summit (Green Summit Steering Group Action Notes, 21 May 2018). The agenda-setting stage of the policy development process would effectively end with the Springboard Report's release, and the workstreams would bring together practitioner knowledge that was required to formulate the technical components of the 5YEP (Green Summit Steering Group Action Notes, 21 May 2018). During the 21 May 2018 GSSG meeting, there were debates about how the groups should be organised, how inclusive they would be, and how they would enable participative policy development (Green Summit

Steering Group Action Notes, 21 May 2018). It was decided during the meeting that while the workstreams were envisioned by GMCA to solely fill a specialist knowledge gap, it was important for them to continue supporting wider public participation established through the listening events and online survey by ensuring a diverse range of perspectives were being sought and respected (Green Summit Steering Group Action Notes, 21 May 2018).

The Springboard Report was released on 27 July 2018, and, as pledged by the GMCA Director of Environment, the strategic document officially elevated and recognised the public engagement that had been central throughout the first Green Summit process. The Springboard Report detailed the public's views articulated through listening events and the first Green Summit. It was meaningful to many GSSG members and individuals who participated in listening events that the Springboard Report reflected the public's views. To this effect, one GSSG member shared,

> "Who would have imagined that number of people would have participated in listening events? I'm excited and hopeful about what that aspect of this process has achieved. When you look at the Springboard Report, citizen feedback from listening events are articulated throughout that documents…We have to listen and develop policy around that listening…"
> — Participant 7, personal communication

There were GSSG meetings in June, July, and September 2018. These meetings primarily focused on the details of planning the second Green Summit. This included discussing topics such as choosing an event the venue, the intended audience size, target audience, desired outcomes, and the agenda (Green Summit Steering Group Action Note, 26 June 2018; Green Summit Steering Group Action Note, 25 July 2018; Green Summit Steering Group Action Note, 14 September 2018). During this period, there was little discussion about policy development other than the GMCA Director of Environment providing progress updates on the Springboard Report and its reception.

During this period, there were, however, discussions about the workstreams. The workstreams were being split into three separate thematic groups — buildings, energy, and sustainable consumption & production — but were all going to be organised and facilitated the same way. The GMCA Director of Environment reflected that this rigidly structured approach was the

only way his small team could undertake detailed policy scoping with their capacity limitations (Green Summit Steering Group Action Note, 25 July 2018). The GMCA Director of Environment discussed that the GMCA Environment Team would first select the workstreams' content by unpacking the main thematic priorities within the Springboard Report (Green Summit Steering Group Action Note, 25 July 2018). The GMCA Environment Team would then identify three to five specific policy goals per theme that they needed external specialist knowledge support to scope deliverable policy actions (Green Summit Steering Group Action Note, 25 July 2018). This framework for the workstreams outlined by the GMCA Director of Environment was presented declaratively to the GSSG and little space for negotiation.

While GMCA narrowly constructed the framework for the workstreams, there was room for discussion and debate surrounding the types of individuals who should participate. The GMCA Director of Environment described his desire to engage with "experts" as a way to fill in the knowledge gaps in his small team (Green Summit Steering Group Action Note, 25 July 2018). However, a large contingent of GSSG members highlighted their preference to include not only a broader range of individuals that could be considered technical experts but individuals with less-professionalized expertise so that the workstreams could make cross-sectoral linkages and approach the workstream topics from with novel perspectives (Green Summit Steering Group Action Note, 25 July 2018). After a discussion, it was agreed that the GMCA Environment Team would invite non-technical practitioners and technical experts to participate in the workstreams, but anyone from the public could join if they asked (Participative Observation Field Note, 25 June 2018). While the GSSG did not have a great deal of input surrounding the workstream framework and content, they were able to influence the types of individuals that would get to participate, which enabled this phase of the policy development process to be more inclusive than it would have without the GSSG's feedback.

As I oversaw the listening event process before the first Green Summit, I was asked by the GMCA Director of Environment to plan the structure of workstream meetings and facilitate the discussions. It was determined by me, the GMCA Director of Environment, and other policy officers in the GMCA Environment Team that GMCA would organise three two-hour meetings per workstream theme and a third meeting that would focus on all three themes together (Participative Observation Field Note, 10 September 2018). We determined that the GMCA Environment Team policy officers would be responsible for deciding what specific content they wanted to explore during the workstreams events, and I would then develop a

structure and facilitation plan for the meetings based upon co-production and participative decision-making theoretical scholarship (Participative Observation Field Note, 10 September 2018). This mutually determined work plan allowed the policy officers to undertake responsibilities they felt comfortable with while allowing me to draw from theoretical understandings to support participative policy-development.

Seven total workstream meetings took place between 29 October 2018 to 31 January 2019. As was agreed during the 25 June 2018 GSSG meeting, technical practitioners were the only type of actors who received personal invitations to participate in the workstreams. A total of 103 individuals participated in the workstream meetings, with most individuals participating in two or more meetings (Participative Observation Field Note, 31 January 2019). The individuals who participated in the workstreams represented a variety of organisations such as Procure Plus, Centrica, Iceland, Cadent Gas, Building Research Establishment, ARUP, Co-op, UK Green Building Council, and Eunomia, amongst others (Participative Observation Field Note, 31 October 2018; Participative Observation Field Note, 28 November 2018; Participative Observation Field Note, 31 January 2019). The workstream meetings were all structured in the same format; the GMCA Director of Environment would first welcome the participants, an Environment Team policy officer would then provide a brief presentation on a narrowly defined topic, and I would finally lead a 70-90 minute facilitated activity in small table groups.

While the workstreams were taking place and the 5YEP was being drafted, the GMCA Environment Team began sharing early versions of the policy with the GSSG. Sharing these drafts was done with the intention that the GSSG could help the GMCA Director of Environment decide how the 5YEP would eventually be 'pitched' to the mayor and Local Leaders for them to deliberate and approve ahead of the second Green Summit (Participative Observation Field Note, 8 January 2019. When the draft policy was ready for political approval, the GMCA Director of Environment would have to give a presentation to the mayor and Local Leaders detailing the policy, including a highlight of identified 'risk areas for consideration' (Participative Observation Field Note, 25 January 2019). The GMCA Director of Environment wanted the GSSG to provide advice about this presentation because he felt the group's diverse perspectives and support throughout the policy development process would help ensure the presentation struck an accurate tone, reflecting the rigour of the science and breadth of public input and reducing the risk that his perspective would influence this presentation of the proposed policy (Participative Observation Field Note, 25 January 2019).

There was one instance in particular where the GMCA Director of Environment shared an early version of this presentation with the GSSG that significantly influenced the final presentation that was given to the mayor and Local Leaders. This contentious discussion focused on how the GMCA Director of Environment should frame the ambition of the 5YEP (Participative Observation Field Note, 8 January 2019). During the 8 January 2019 GSSG meeting, the GMCA Director of Environment stated that he wanted the presentation to focus on policy actions that the SCATTER tool showed would likely possible, rather than focus on the policy actions that the Tyndall Centre recommended for the city-region to stay within its carbon budget (Participative Observation Field Note, 8 January 2019). The GSSG firmly pushed back against this calculation by the GMCA Director of Environment, making numerous arguments as to why this presentation should focus on the challenging policy actions that were more ambitious but in-line with what would keep the city-region within its carbon budget. One GSSG member who would make these arguments during the 8 January 2019 GSSG meeting shared why he thought this was a critical moment during the process.

> "I felt it was morally wrong to present what we — the individuals responsible for implementing the plan — thought was practically doable rather than what the science determined as necessary. If we are going to claim to be developing policy through a science-based approach as we are, we need to ensure we are truly being led by the science — especially when it's difficult. I felt very strongly that it was our job to inform the mayor and leaders what the science determined were necessary and let them as the politicians make the decision whether or not they would indeed be led by the science." — Participant 12, personal communication

After a lengthy contentious debate during the 8 January 2019 GSSG about this issue, it was agreed that the GMCA Director of Environment would focus his presentation on the challenging policy actions determined by the science (Green Summit Steering Group Action Note, 8 January 2019). The GMCA Director of Environment reflected on this decision and how the GSSG influenced him on this matter by stating,

> "I wanted to have a Steering Group because I knew I would need to be challenged. If I'm going to do things differently — if I'm going to support policy in a novel way — I need to be questioned critically by trusted individuals. That interaction was one where

> I was overwhelming challenged and given a myriad of reasons why I was wrong. I listened to the consensus of the Steering Group, and I think the outcome of this process has been better for it."
>
> — GMCA Director of Environment, personal communication

One week before the second Green Summit took place, the GMCA Director of Environment gave his presentation to the mayor and Local Leaders. Following the presentation and deliberation, the political figures determined that they would support all of the presented policy measures but would need more time before committing financial resources from GMCA to fund the specific projects that were outlined (Participative Observation Field Note, 15 March 2019). The mayor and Local Leaders decided they would announce at the second Green Summit their intention to take — in their words — ambitious policy action on climate change. However, they chose not to announce concrete policy commitments requiring GMCA funding at the Green Summit. Instead, they decided to make a firm policy decision a few days after the Green Summit to seek clarification from the GMCA Environment Team about the implications of funding particular policy measures (Participative Observation Field Note, 15 March 2019). While this meant the mayor could not firmly announce any specific new, definitive policy initiatives at the second Green Summit, the decision did mean the mayor would be able to announce the rough outlines.

The second Green Summit was held on 25 March 2019 and took place at The Lowry. Over 1,700 individuals attended the event, including 300 school children from across Greater Manchester's ten districts (Participative Observation Field Note, 25 March 2019). The mayor opened the event by hosting a discussion with roughly 15 youth climate strikers to highlight the climate crisis's immediacy and consider the scale of action required to address the challenge (Participative Observation Field Note, 25 March 2019). This was followed by two keynote speeches from the Prince of Wales and renowned poet Lemn Sissay. Councillor Ganotis then gave a speech highlighting the main themes of the 5YEP and committed the GMCA under the leadership of the mayor and Local Leaders to implement the policy following its official launch in a few days (Participative Observation Field Note, 25 March 2019). Attendees then broke out for lunch, where they were asked to spend time between three separate 'zones' focused on exploring the public sector, private sector, and citizens' role in supporting the 5YEP (Participative Observation Field Note, 25 March 2019). After the breakout lunchtime session, all of the attendees came back into the main auditorium, where two more keynote speakers

gave presentations, and the mayor hosted an informal discussion with two panellists about the importance of sustainable living. The second Green Summit concluded with a 'commitments session' where large organisations in the city-region made specific commitments about the actions they were going to take, which would support the implementation of the 5YEP (Participative Observation Field Note, 25 March 2019).

The 2019 Green Summit culminated with the mayor launching the 5YEP and asking actors across the city-region, from large companies and universities to small community groups and individual citizens, to take action alongside GMCA in supporting the policy. While the mayor was closing the event, he was interrupted by a group of Extinction Rebellion activists who staged a non-violent direct-action protest. They unfurled banners and stood silently in front of the stage, obstructing the audience's view of the mayor (Participative Observation Field Note, 25 March 2019). After a few moments, the mayor handed his microphone to the activists and invited them to make a few brief remarks to express their concerns (Participative Observation Field Note, 25 March 2019). Three of the activists gave short speeches, highlighting the need to tell the truth about the climate crisis and commit to doing more and faster, before giving the microphone back to the mayor (Participative Observation Field Note, 25 March 2019). He then thanked the activists and other environmentalists in Greater Manchester for pushing him to take forceful action on climate change (Participative Observation Field Note, 25 March 2019). The mayor closed the event by promising to listen to the voices of the youth climate strikers who opened the event and heed the concerns of the Extinction Rebellion activists by using his platform as mayor to push the city-region to take meaningful policy action on climate change as quickly as possible (Participative Observation Field Note, 25 March 2019).

The 5YEP was officially endorsed and launched by the mayor and Local Leaders during the 29 March 2019 GMCA Monthly Leadership meeting (Greater Manchester Combined Authority 2019). This final adopted policy was virtually the same document that the mayor touted at the Green Summit just four days earlier. After the 5YEP was formally adopted at this meeting, there was no fanfare or press releases. The Green Summit had captured that enthusiasm. Councillor Ganotis shared his thoughts on the final version of the 5YEP by stating,

> "The challenge is people actually needed to see what they said reflected in the 5-Year Plan. Before the plan was finished, I was nervous about people feeling that what they were telling us would be contradicted in the 5-Year Plan…Ultimately, it's now up to

> individuals that have contributed to the plan to read it and determine whether or not they think we accurately captured what they've told us."
>
> — Leader Stockport Council, personal communication

The 5YEP's development process was complicated and traversed numerous obstacles. Ultimately, the final version of the 5YEP met the mayor's manifesto commitment, but the co-productive approach utilised to develop the plan took a year longer than had been proposed from the outset of this process. The policy development approach that was adopted by the GMCA Environment Team did support some characteristics of co-production that were evaluated in the conceptual framework. As analysed throughout this chapter, the co-productive approach to climate politics did support some robust contestation between stakeholders with various perspectives, enabled politicians and leaders to begin engaging in the risky politics of climate change and facilitated some creative problem-solving approaches between individuals with different knowledge and skills. However, this chapter also demonstrates the challenges and limitations of co-productive approaches in an empirical setting. For instance, politicians and leaders struggled to share power with the stakeholders who participated in this process, specialist knowledge contributions from technical experts were valued differently in policy decision-making from tacit knowledge contributions, and certain diverse perspectives were excluded from participating in policy debates.

Overall, this chapter demonstrates that while the 5YEP's development process supported some aspects of co-production, the policy development approach also faced some of the same constraints of urban climate policy development approaches. Some of these limitations include supporting limited policy debate between conventional and heterodox perspectives, delineating decision-making power narrowly, restricting the scope of contestation of policy options outside the current political-economic paradigm. This led the co-productive policy development approach to facilitate some novel procedural innovations consistent with the conceptual framework's analysis while determining conventional urban climate policy outcomes. Having now evaluated the 5YEP's development process, the thesis will analyse in detail the co-productive pathways that developed and transpired throughout the policy development process.

6. Policy and Procedural Innovations: Did Co-Production Lead to Novel Outcomes?

The previous empirical chapter of this thesis evaluated the 5-Year Environment Plan's (5YEP) development process. This last chapter analysed the co-productive approach the Greater Manchester Combined Authority (GMCA) Environment Team adopted to produce the strategy and examined the actors, interests, and challenges that were involved throughout the process. The thesis will now explore the policy and procedural effects of the co-productive approach. This chapter evaluates how the co-productive policy development approach manifested and unpacks its implications for policy outcomes within the 5YEP. Overall, the chapter finds that the 5YEP was developed through novel policy development pathways facilitated through the co-productive approach, but these co-productive innovations were not codified into surprising or transformative policy outcomes. This chapter's analysis explicitly responds to the study's second research question – *how might a co-productive approach support urban climate policy development and what are the limits* – and in doing so, additionally provides analysis that creates opportunities the study's additional research questions to be addressed in the following empirical chapters.

This chapter begins by examining why the GMCA Environment Team deliberately intended to facilitate the 5YEP's development process using a co-productive approach. It does this by analysing four different factors that, in combination, gave the GMCA Environment Team its understanding of co-production and motivation to adopt the concept as a policy development approach. Next, the chapter evaluates five distinct co-productive pathways that different types of stakeholders participated in. This section analyses the particular types of stakeholders (ie policy professionals, active stakeholders, interested citizens) that participated in each of these pathways and explores each pathway's contribution to the policy development process. Finally, the chapter evaluates the policy outcomes that resulted from the novel co-productive policy development approach. This section finds that while the co-productive approach supported procedural innovations, the process's outcomes were consistent with those found in a conventionally developed urban climate policy. Through its analysis, the chapter provides an empirical evaluation of how co-production manifested in one institutional urban policy development setting, supporting different types of stakeholders engaging in particular forms of policy debates and the impact that contestation had on for the policy outcomes.

6.1. Why co-production? Motivations for the co-productive approach

City-regional environmental and climate policy in Greater Manchester has historically been developed through voluntary partnerships between the Association of Greater Manchester Authorities (AGMA) — and, more recently, the GMCA — with large organisations and key stakeholder groups in the city-region. Before the Greater Manchester 5-Year Environment Plan was launched by GMCA in March 2019, the city-region's previously adopted environmental and climate strategy was the 'Climate Change and Low Emissions Implementation Plan 2016-2020' (CCLEIP) that was launched in 2016 (Greater Manchester Combined Authority 2016). An entire section of the CCLEIP titled "Working Together" is dedicated to highlighting the significance GMCA has traditionally placed on partnerships to deliver city-regional climate and environmental policy measures (Greater Manchester Combined Authority 2016). While GMCA has a history of developing policy with external policy actors, these relationships have been hierarchal, distributed policy development power asymmetrically between GMCA and its 'partners' and the types of policy actors that GMCA partnered with were limited to technical practitioners (Observant Participation Field Note, 17 December 2018).

Before initially embarking on the 5-Year Environment Plan's development process, the GMCA Environment Team had some experience using its relationships with external policy actors to co-develop policy through policy development pathways (Participant 4, personal communication). In the past, the GMCA Environment Team wanted to develop policy through these partnership arrangements to then be implemented in partnership with those same external policy actors (Participant 4, personal communication). Previous policies the GMCA Environment Team developed through these partnership pathways fell short of achieving their implementation aspirations (Participant 4, personal communication). Therefore, the GMCA Environment Team approached the 5-Year Environment Plan's development process as an opportunity to learn from their previous shortcomings and install a new approach (Participant 4, personal communication).

While the GMCA Environment Team had experience developing policies in coordination with technical experts before the Mayor’s election in May 2017 and manifesto promise to hold a Green Summit, the team had never attempted to develop policy in partnership with a wide range of the public that included citizens, activists, and non-technical practitioners (Observant

Participation Field Note, 15 December 2018). Different groups of policy actors throughout the public, including citizens, also expressed their distinct interests in co-developing climate policy in partnership with GMCA rather than provide feedback during consultation activities, a task which the public had undertaken previous during policy development processes (Observant Participation Field Note, 3 November 2017). The GMCA Environment Team's background is instructive for understanding why they were interested in pursuing a co-productive approach to develop the 5-Year Environment Plan with citizens and the public.

Beyond this general ambition, there are four specific reasons why the GMCA Environment Team aspired to co-produce the 5-Year Environment Plan with citizens, public stakeholders, and practitioners. The first of which is the Manchester Is My Planet programme. This programme focused on increasing public awareness on climate change amongst citizens, private sector organisations, politicians and local government authorities throughout Manchester and encouraged them to take action towards reducing their carbon footprints, supporting the city-region as a whole to deliver its low carbon ambitions (Robinson 2009). Manchester Is My Planet demonstrated to GMCA that it was possible to effectively work on a large-scale climate change initiative across the city-region involving local authority policy officers, politicians, and citizens (Participant 6, personal communication). Moreover, this programme demonstrated to AGMA policy officers (now GMCA) that, even with their limited resources and capacities, they could help lead the city-region wide engagement programme with external partners (Participant 6, personal communication). An individual involved in the both Green Summits and the 5-Year Plan development process noted the importance of the Manchester Is My Planet legacy when stating,

> "The Green Summit and strategy (5YEP) wasn't the first time we got all of the Local Authorities to work together on this topic…Manchester Is My Planet proved that we could work in agglomeration on this issue and bring the boroughs together".
> — Participant 6, personal communication

The second factor that propelled the GMCA Environment Team to develop policy through participative co-productive processes was the 2012 Greater Manchester City Deal and the formalised devolution process in Greater Manchester. Within the City Deal legislation, GMCA agreed to establish a 'Low Carbon Hub' — a partnership group between GMCA and large organisations in the city-region — which would advance Greater Manchester's carbon

reduction and low carbon economic development ambitions through a new collaborative institution (Greater Manchester City Deal 2012). The Greater Manchester Low Carbon Hub establishment codified GMCA's commitment to pursuing low carbon policy development and implementation with the input and support of key organisations in the city-region (Participant 13, personal communication). The Greater Manchester City Deal formalised GMCA's commit to a culture of partnership work and was another crucial development that made the GMCA Environment Team more interested in pursuing co-productive policy development with external partners.

Thirdly, the GMCA Environment Team was exposed to the concept of co-production through a research project undertaken with academics from the University of Salford. The Governance and Policy for Sustainability (GAPS) project took place from 2012-2014 and notably exposed the GMCA Environment Team policy officers to the concept of co-production and how the concept could apply to their work (Perry & Atherton 2017). One of the focus areas the GAPS project investigated was identifying how different stakeholder groups and communities in the city-region influenced environmental and climate policy development (Perry & Atherton 2017). This research enabled the GMCA Environment Team to consider the different types of policy actors involved in policy development and contemplate what stakeholder groups their current policy development processes neglect to include (Perry & Atherton 2017). While the GAPS project formally concluded in 2014, the relationship between the academics and policy officers remained ongoing, which has continued the GMCA Environment Team's learning on co-production.

Finally, the Mayoral Manifesto and election of Andy Burnham is a fourth factor that influenced the GMCA Environment Team's desire to utilise co-productive policy development frameworks. In the Manifesto, the then mayoral candidate promised to host a Green Summit, which would support public debate on what the city-region's climate policy aspirations should be and that if elected, he would create new climate policy accelerating the city-region's carbon neutrality ambitions (Burnham for Mayor 2017). When Burnham was elected, senior policy officers at GMCA examined his Manifesto, and various teams were delegated responsibility for delivering the manifesto pledges (Participant 4, personal communication). It was determined that the Environment Team would support the Green Summit and associated carbon neutrality policy pledge (Participant 4, personal communication). As specified in Manifesto, the Mayor wanted to lead a public debate amongst different stakeholder groups

within the city-region and the GMCA Environment Team was compelled to think about how they would facilitate this process (Participant 4, personal communication). All four of these previous experiences made the GMCA Environment Team comfortable with the idea of co-producing policy and inclined to create co-productive policy development pathways.

6.2 The co-productive pathways

Above, I explored how the GMCA Environment Team gained an understanding of co-production and ultimately determined to adopt the approach as they embarked on developing the 5YEP. Once this determination had been made, the GMCA Environment Team needed to cultivate pathways within the policy development process that could support co-production. In this section of the chapter, I will evaluate the different co-productive pathways that were utilised during the 5YEP's development process and analyse the different types of stakeholders that participated in each pathway. Each of the four co-productive pathways engaged a different set of policy professionals, active stakeholders and interested citizens in the 5YEP's development process (see Chapter 4.5.2). The section also evaluates a non-co-productive administrative pathway. This section examines the policy interests and agendas that each co-productive pathways contributed to the policy development process. This section highlights that the co-productive approach took multiple forms, each making a particular contribution to the overall policy development process.

To evaluate the various co-productive pathways during the 5-Year Environment Plan's development process, I collected data and analysed the effect that 93 different policy professionals, active stakeholders and interested citizens had during the 5-Year Environment Plan's development in a Stakeholder Participation Scorecard. The Stakeholder Participation Scorecard evaluates the impact and contribution of each particular stakeholder across various factors such as the duration of their involvement during the policy development process, the time they committed the process, and the pathways in which they were involved. I will now analyse and evaluate the contributions of these 93 different stakeholders through four different co-productive pathways as well as a fifth administrative pathway that these stakeholders engaged in during the 5-Year Environment Plan's development: the Green Summit Steering Group (GSSG), listening events, thematic practitioner workstreams, and Green Summits.

The first co-productive pathway that stakeholders gained entry into the policy development process was through the GSSG. As discussed in Chapter 5.1, the GMCA Environment Team intentionally invited what they described as a diverse range of organisations to join the GSSG (Observant Participation Field Note, 9 November 2017). A key reason why the GMCA Environment Team wanted to have a broad spectrum of policy actors participating in the GSSG was to ensure that there would be varied perspectives helping plan the Green Summits and shape the development of the 5-Year Environment Plan (Participant 4, personal communication). The GMCA Environment Team thought that by establishing a co-productive policy development pathway that enabled a constellation of policy actors with diverse experiences and backgrounds to participate in regular policy deliberations, that the eventual policy outcomes would be more robust, ambitious and more reflective of the Greater Manchester social landscape (GMCA Director of Environment, personal communication, 4 November 2017).

The GMCA Environment Team conducted an analysis internally during the summer of 2017 to determine what stakeholders should be involved in the GSSG (Participant 5, personal communication). Following this analysis, the GMCA Director of Environment personally invited individual policy actors to join the GSSG (Participant 4, personal communication). There were no selection criteria developed for what types of organisations should be invited to the GSSG (Participant 5, personal communication). In practice, this meant the GMCA Director of Environment ended up only inviting stakeholders to join the GSSG that he knew before embarking on this process (Participant 4, personal communication). While the GMCA Director of Environment invited what the GMCA Environment Team considered a broad range of stakeholders, the field of potential GSSG members was immediately whittled down because only those familiar to the organisation were considered. This meant only a limited range of organisations and perspectives were in engaged in policy decision-making through the GSSG, limiting the potential range of policy debate. (Observant Participation Field Note 12 January 2018).

There were 27 total policy professionals and active stakeholders who were members of the GSSG and represented the voluntary, private, and civil sectors and campaigners and academics. The GSSG members represented organisations of all sizes, from small charity groups to medium-sized organisations to large regional organisations. Each organisation also held a different specialty and form of knowledge that they could contribute toward co-productive

decision-making. The Stakeholder Participation Scorecard illustrates that 16 of the 27 GSSG members primarily contributed specialist knowledge (Observant Participation Field Note, 15 December 2017; Observant Participation Field Note, 6 February 2018). Moreover, the 11 active stakeholders who primarily contributed tacit forms of knowledge were fluent in the technical dimensions of climate and environmental issues as each of their roles within their organisations was connected to supporting climate and the environmental projects (Observant Participation Field Note, 20 November 2017; Participant 14, personal communication). As one aspect of the GSSG's purpose was intended to engage non-technical stakeholders within the policy development process, one may have anticipated a greater number of stakeholders on the GSSG be primarily tacit knowledge contributors and hold a different professional background.

The policy professionals and active stakeholders who supported the GSSG had several motivations for engaging in the co-productive policy development pathway. Several stakeholders described their primary motive for participating in the GSSG as rooted in their professional responsibility. This job-based motivation was primarily described by policy professionals but some active stakeholders representing third sector organisations also noted this motive, believing that engaging in local government policy mechanisms was a key duty of their roles (Participant 1, personal communication; Participant 7, personal communication). Other GSSG members described business development as a driver of their participation in the GSSG (Participant 6, personal communication; Participant 15, personal communication). These active stakeholders discussed demonstrating their skills, knowledge and expertise to new audiences through the GSSG as a way to spark future business partnerships (Participant 6, personal communication; Participant 15, personal communication). A further group of active stakeholders discussed their primary motive for engaging in the GSSG as being tactical and a calculation that engaging in the co-productive pathway could help raise the profile of their particular organisation and issues they advocate for (Participant 16, personal communication; Participant 3, personal communication).

While these different factors motivated some of the policy professionals and active stakeholders to participate in the GSSG, all GSSG members described a shared altruistic and ethical drive for participating in the group. One GSSG member encapsulated this shared motivation when they reflected during an interview,

> "I don't want to be in a situation 10 years down the line when my kids ask me 'Dad, what did you during in the war?' and I know that I missed an opportunity to make a meaningful impact. I don't assume I can make a significant impact alone, but I believe that in some small ways I can help and make a difference by working with other passionate people with different strengths and perspective."
> — Participant 15, personal communication

The GSSG was an important pathway that enabled numerous policy professionals and active stakeholders to gain entry into the 5-Year Environment Plan's development process. While this pathway enabled long-term participation throughout the policy development process from numerous stakeholders, it did not directly engage any stakeholder actors previously unknown to the GMCA Environment Team. Despite that, the GSSG members did help to raise several policy agendas through their engagement in the process. Additionally, while the GSSG members were motivated to participate in the group for several different reasons, they all shared a core ethical belief, which ultimately drove their participation. This co-productive pathway was undoubtedly an important and influential policy development mechanism that enabled policy professionals and active stakeholders to make meaningful contributions to policy debates throughout the 5YEP's development process.

The listening events were the second co-productive pathway within the 5YEP's development process. The GMCA Environment Team wanted to produce a climate strategy that the public could see their views and desires reflected in (see Chapter 5.1). The GMCA Environment Team proposed the listening events as a co-productive pathway to capture the public's views and desires, and this idea was then shaped and supported by the GSSG (see Chapter 5.1). The listening event co-productive pathway was idealistically intended to engage a broad, diverse group of interested citizens throughout the city-region (Observant Participation Field Note, 17 October 2017). However, this ambition proved challenging to realise and led to various clusters of interested citizens being engaged through the listening event pathway.

As I evaluated in Chapter 5.2, the breath of interested citizens involved through the listening event pathway evolved throughout the policy development process. Initially, the GMCA Environment Team intended for the listening event pathway to engage a limited selection of sectoral experts through roughly six listening events (Participant 5, personal communication). The GMCA Environment Team shared their intended scope and purpose for the listening event

pathway with the GSSG and the GSSG then argued successfully for the co-productive pathways to expand its reach to a broader constellation of interested citizens, notably to include underrepresented minority voices (Participant 5, personal communication). In total, over 1,200 interested citizens participated in the policy development process through the 42 listening events (see Chapter 5).

The listening events mainly engaged interested citizens who held existing concerns about the environment and climate change (Participant 4, personal communication). The listening events captured a significant amount of data from interested citizens who were previously known to the GMCA Environment Team and did not as successfully capture input from new, unfamiliar stakeholders (Participant 4, personal communication). One of the GMCA Environment Team's intentions for the listening event pathway was to capture input and data from previously unknown interested citizens and the co-productive pathway fell short in this ambition (Participant 17, personal communication). Furthermore, the GMCA Environment Team hoped the non-traditional stakeholders who participated in the listening event pathway would add new discourses to the policy development process and this ambition was not fully satisfied (Participant 17, personal communication). The GMCA Director of Environment gave credence to these developments saying,

> "If you look at the listening events…the majority of people that attended those were people I had no previous relationship with. Even the events I supported were mostly filled with usual suspects. I certainly had previous relationships with some people that participated in listening events, but the vast majority were new faces and raised some new issues that we've added to the Springboard Report."
> — GMCA Director of Environment, personal communication

A dilemma that this quote speaks to relates to the impact of power that was nascent during decision making throughout the 5-Year Environment Plan's development. Although this policy development process was envisioned to be co-productive and highly publicly participative, GMCA wielded 'ideological power' which created a potential for certain types of interests or groups to be subtly or even explicitly excluded from the co-productive pathways such as the listening events (Lukes 2004). This ideological power over the co-productive pathways materialised through seemingly small, inadvertent decisions made by GMCA to discount particular views that existed in the broader community because they conflicted with

institutional practices that governed GMCA's operating values. For instance, there were several opportunities for listening events to be held with previously unknown interested citizens who held views which were counter to GMCA's ideological position in areas including local economic development or models of housing and land ownership that GMCA decided not to support (Observant Participation Field Note, 6 February 2018; Observant Participation Field Note, 3 March 2018).

In these instances, GMCA used their ideological power over decisions within the co-productive pathways – like potential listening events with interested citizens that held what GMCA viewed as radical positions – to close off opportunities for new ideas and perspectives that existed beyond the conventional boundaries familiar to GMCA policy officers to be injected into the process. The potential of co-production to enable this policy development process to create novel, even transformative outcomes, would have been advanced and further supported through policy negotiations between individuals with divergent perspectives. GMCA's ideological power which shaped what co-production meant within this process, ultimately limited the range of perspectives that could access the co-productive pathways (Participant 16, personal communication; Observant Participation Field Note, 20 November 2017).

The interested citizens that did engage in the policy development process through the listening events advocated for a plethora of different issues. Despite the interested citizens' advocating for a range of policy issues through the listening events, some noteworthy trends emerged. The technical practitioners who participated in listening events raised narrow, specific issues that were largely limited within the scope of one thematic area of the 5YEP (ie energy, transportation, buildings, consumer production, etc.) (Participant 9, personal communication; Greater Manchester Combined Authority, 2018). Technical practitioners broached climate challenges through technocratic approaches and typically advocated for incremental policy proposals. Meanwhile, the concerned citizens and youth who participated in listening events mainly advocated for cross-sectoral policy actions intended to support systemic level change (Observant Participation Field Note, 3 March 2018; Observant Participation Field Note, 17 April 2018; Participant 9, personal communication). Concerned citizens and youth approached challenges differently in listening events than technical practitioners by discussing their ideas across thematic silos (Observant Participation Field Note, 3 March 2018; Participant 9, personal communication). While concerned citizens and youth typically proposed broad, undefined policy action, their proposals were more imaginative and transformative.

There were many different policy interests that technical practitioners, concerned citizens, and youth advocated for. Quantum Technology & Strategy and I analysed the data outputs from listening events into an internal report for the GMCA Environment Team, examining what policy measures were raised in listening events and in how many listening events each policy measure was discussed (Observant Participation Field Note, 10 April 2018). The range of policy measures that interested citizens proposed through the listening events ranged from integrating ticketing on Greater Manchester's public transportation network to mandating all councillors and local authority staff become 'carbon literate' to establishing retrofit planning standards with delivery targets to developing a publicly managed Greater Manchester climate project investment vehicle (see Greater Manchester Combined Authority, 2018). The variety of policy measured proposed through the listening events was significant, but the intersectional, cross-sectoral nature of many policy measures helped push the policy development process to go beyond conventional technocratic policy actions and consider more transformative alternatives. However, the radicalness and transformative potential of the 5-Year Environment Plan's policy measures that resulted from the listening events were ultimately limited by GMCA's ideological power over the listening event co-productive pathway and their narrow capacity to enable policy negotiations with perspectives beyond what they perceived as practical.

There were three primary reasons why interested citizens engaged in the listening event. The first was an altruistic motivation to take action. Climate change is a profoundly personal challenge for many people — activists, practitioners and concerned citizens alike. The interested citizens that participated in listening events discussed this co-productive pathway as a mechanism for them to feel like they were making a small difference. One interested citizen who organised a listening event with the Levenshulme Labour Party branched discussed this during an interview by reflecting,

> "They (the branch party members) were excited because they were really being listened to…and I think they felt the need to do something about climate change on their own person level. The listening events were a positive way for them to make a difference on climate change at locally level and personal level."
> — Participant 2, personal communication

The second reason interested citizens engaged in listening events was to promote a particular policy measure they feared would be neglected without their involvement (Observant Participation Field Note, 5 February 2018; Observant Participation Field Note, 26 February 2018). These specific policy actions interested citizens felt a need to advocate for ranged from developing skills training programmes to support domestic retrofit initiatives to including social justice measures in climate policy decision-making (see Greater Manchester Combined Authority, 2018). The third motivating reasons interested citizens participated in listening events was out of fear that the eventually produced policy document would "not go far enough" and saw listening events as a mechanism to increase the policy's ambition (Observant Participation Field Note, 6 February 2018; Observant Participation Field Note, 2 March 2018). Many interested citizens who participated in listening events had previously engaged in GMCA climate and environmental policy development processes and believed those processes yielded insufficiently rigorous policy outcomes (Participant 9, personal communication). Some interested citizens who engaged in the listening event pathway described just one of these factors as being their primary motivation, while others discussed a combination of these factors combining to motivate their participation.

The third co-productive pathway was the 'thematic practitioner workstream'. By the summer of 2018, the GMCA Environment Team had developed a defined set of climate policy priorities captured in the Springboard Report (see Chapter 5.3). While the priorities of the 5YEP had been identified at this time in the policy development process, the GMCA Environment Team policy officers did not possess the precise expertise and knowledge needed to translate the co-developed policy ambitions into a precisely formulated strategy (Participant 19, personal communication). Therefore, the GMCA Environment Team decided to develop a series of workshops to fill their internal knowledge gap by seeking expert practitioners' support from the resource management and manufacturing, energy and building sectors (Participant 17, personal communication).

From June through September 2018, the GMCA Environment Team decided to develop workstreams in just three thematic areas — sustainable consumption and production, energy, and buildings. There were three additional thematic areas discussed in the Springboard Report that the Environment Team decided not to focus on through workstreams. Natural environment had a long-existing 'expert' engagement mechanism — the Natural Capital Group — that the GMCA Environment Team determined would fulfill a workstream (Observant Participation

Field Note, 20 June 2018). Transportation was an area that would be led by Transport for Greater Manchester (TfGM). TfGM decided they would develop the 5YEP's transportation policy measures within their organisation without involving external practitioners (Observant Participation Field Note, 25 July 2018). The GMCA Environment Team decided the third theme — engagement, education, and skills — would be developed as a "cross-cutting concept" within all of the sectoral areas (Participant 19, personal communication; Participant 17, personal communication). Once the GMCA Environment Team had determined to hold these three thematic expert workstreams, I was tasked with scoping and facilitating the workstreams through a co-productive approach (Participant 17, personal communication).

The GMCA Environment Team expressly wanted to engage stakeholders through the workstreams they perceived as technical experts who held specialist knowledge. The GMCA Environment Team posited that the listening events and 2018 Green Summit that engaged interested citizens helped shape the aspirations of the 5-Year Environment Plan, but those loosely outlined ambitions needed the support of technical experts to help define those ambitions into targeted, measurable and deliverable policy objectives (Observant Participation Field Note, 26 June 2018). To achieve this, the expert workstreams were intended to convene a collection of 'expert' policy professionals and interested citizens in each thematic area to augment the knowledge of the GMCA Environment Team (Observant Participation Field Note, 26 June 2018; Participant 19, personal communication). This approach provided the GMCA Environment Team with the specialist knowledge necessary to produce concrete policy actions around the Springboard Report's ambitions. A GMCA Environment Team policy officer responsible for one of the workstream's thematic areas reflected on this, stating,

> "We needed to organise experts from a multitude of backgrounds and skillsets to help us put all of the detail on the table behind what was said in the Springboard Report. The workstream was vital in helping breakdown exactly what we were trying to do and how we could do it. It was very important to have those workstreams provide detail and challenge…My skills didn't put me in a position to write this policy document but I was able to write it with everyone's help by critically playing to their skills."
> — GMCA Environment Team Policy Officer, personal communication.

Most of the stakeholders that participated in the workstreams were invited by the GMCA Environment Team. The three GMCA Environment Team policy officers responsible for

sustainable production and consumption, energy and building portfolios all provided a list of technical experts who they had worked with in the past that were solicited by email to participate in an initial round of workshops in late October and early November 2018 (Observant Participation Field Note, 28 September 2018). The invited expert practitioners consisted of policy professionals and active stakeholders from consultancy firms, academics from local higher education institutions, independent contractors, policy officers from regional government agencies and practitioners from private organisations (Observant Participation Field Note, 28 September 2018). There were three separate workshops for each of the workstreams and about 25 stakeholders attended each workshop (Observant Participation Field Note, 31 January 2019). The majority of stakeholders attended all three workshops in their given workstream, but some stakeholders only attended one or two of the workshops.

The stakeholders that participated in the workstreams did not add any entirely novel agendas to the 5-Year Environment Plan's development process. This was due to the workstreams having the primary objective of developing the details behind interests that had already been put forward in the Springboard Report (Observant Participation Field Note, 28 September 2018). However, the workstreams did contribute new detailed concepts for programmes that could deliver the Springboard Report's policy ambitions (Observant Participation Field Note, 31 January 2019; Observant Participation Field Note, 7 February 2019). In other words, the workstreams did not conceive new agendas that gained traction in the policy development process but rather formulated the 'how' behind the 'what' that was stated in the Springboard Report (Observant Participation Field Note, 31 January 2019).

The stakeholders who participated in the workstreams described being motivated to support the co-productive pathway to ensure that the 5-Year Environment Plan's policy actions would be robust and deliverable (Observant Participation Field Note, 31 January 2019; Participant 18, personal communication). They believed they possessed the specialist knowledge necessary to support the development of actionable policy measures within the 5YEP (Participant 20, personal communication; Observant Participation Field Note, 31 January 2019). Furthermore, these stakeholders also discussed being motivated to support the workstreams because they understood the 5-Year Environment Plan would likely have an impact on their work and by influencing the policy, they could potentially make the implementation of the policy measure more streamlined within their organisations (Observant

Participation Field Note, 29 November 2018; Observant Participation Field Note, 31 January 2019).

The fourth co-productive pathway was the 2018 and 2019 Green Summits. This co-productive pathway directly emerged from the mayor's manifesto pledge and was intended to be a platform for the city-region to build support for a new climate agenda (Burnham for Mayor 2017). The GMCA Environment Team was initially in charge of developing and organising the Green Summit pathway and quickly decided to create the GSSG to support their efforts, in addition to other reasons (see Chapter 5.1). The GMCA Environment Team and GSSG used the Mayoral Manifesto as a foundation for the Green Summits but had a broad degree of flexibility to develop this pathway as they saw appropriate.

From Sept 2017 through March 2019, the GMCA Environment Team and GSSG designed, planned, organised and facilitated the 2018 and 2019 Green Summits (see Chapter 5). The policy professionals and active stakeholders engaged in supporting the Green Summit pathway determined the 2018 Green Summit would support three main priorities — to give interested citizens visibility into the data being used to develop the 5YEP, present political leadership an opportunity to promote the significance of the 5YEP, and enable interested citizens to provide feedback on the process that had transpired (Observant Participation Field Note, 17 October 2017; Observant Participation Field Note, 9 March 2018). The GMCA Environment Team and GSSG intended for the 2018 Green Summit to engage broad audiences of interested citizens that were representative of some of Greater Manchester's communities (Observant Participation Field Note, 22 December 2017). Meanwhile, the 2019 Green Summit was designed to articulate the ambitions of the 5YEP and demonstrate the role different sectors in Greater Manchester had to support the delivery of the policy as well as engaging the city-region's youth as leaders (Observant Participation Field Note, 8 January 2019, 22 November 2018). The GMCA Environment Team and GSSG wanted the 2019 Green Summit to engage a similar audience as the 2018 Green Summit (Observant Participation Field Note, 9 October 2018; Observant Participation Field Note, 8 January 2019). However, they wanted to develop tailored information and activities for specific audiences (Observant Participation Field Note, 8 January 2019).

The GMCA Environment Team initially conceived the Green Summit co-productive pathway as a high-profile communication mechanism but the GSSG envisioned this pathway as

interactive and dynamic. However, the mayor's vision also had a significant contributing influence over the Green Summit pathway's direction. As I evaluated throughout Chapter 5, the mayor was not intimately involved in planning the Green Summits or developing the 5YEP. However, he and his office did have oversight of the Green Summits and would use this position to influence key decision-making, even if it contradicted the actions of the GMCA Environment Team and GSSG. For example, the mayor wanted to use the 2018 Green Summit as an opportunity to elevate Greater Manchester as one of the leading 'green cities of Europe' and demonstrate the city-region's commitment to action (Observant Participation Field Note, 6 February 2018). In this sense, the mayor intended to use the Green Summit as a mechanism to elevate his and the city-region profile over individual stakeholders' particular perspectives with a desire to participate in the 5YEP's development. For example, when the GMCA Environment Team and GSSG developed a preliminary agenda for the 2018 Green Summit that included giving youth and trade union representatives a platform to participate in public deliberations, the mayor declined the proposal and opted to elevate the voices of local high-profile celebrities to promote the city-region's green leadership ambitions. One GSSG member discussed this dichotomy in stating,

> "The (Green Summit) Steering Group was much closer to the community than GMCA and knew the public would better receive the message of people on the ground rather than a footballer who's trying to build a development on the green belt. The mayor wanted to bring him in for publicity and didn't understand the anger people felt towards him."
>
> — Participant 2, personal communication

While the active citizens who supported the GSSG generally wanted to use the Green Summit pathway to elevate diverse stakeholders' perspectives and agendas from throughout the city-region in policy deliberations, the mayor frequently wished to utilise this pathway to showcase his agenda. Ultimately, the GSSG and mayor both compromised and the Green Summit pathway attempted to achieve both sets of objectives (see Chapter 5.2 and Chapter 5.3). The 2018 and 2019 Green Summits both provided some opportunities for interested citizens to engage in policy debates while also giving the mayor a platform to demonstrate the city region's ambitions (Participant 1, personal communication; Participant 21, personal communication). The Green Summit pathway served as an important co-productive mechanism that enabled

interested citizens to gain visibility into the 5YEP's development and, in limited forms, engage in the process.

In addition to the four co-productive pathways, the 5YEP's development process also included a fifth bureaucratic pathway that was not co-productive. This pathway — that I evaluate as the administrative pathway — was consequential to the 5-Year Environment Plan's overall outcome. The administrative pathway was not co-productive and narrowly centred around two separate technocratic governance apparatuses (Participant 14, personal communication). The GMCA is a complex administrative organisation with numerous political layers that impact policy development. Although Mayor Andy Burnham is the political leader of the GMCA, the organisation can only ratify a policy through a majority vote of the Senior Leadership Team (SLT) that consists of the ten local authority council leaders, the Mayor of Greater Manchester, the ten chief executives of each local authority council and the chief executive of GMCA (Greater Manchester Combined Authority 2019). The SLT was not regularly involved in the 5YEP's development process but provided final decision-making sign-off at key stages (Participant 17, personal communication; Greater Manchester Combined Authority, 28 June 2019).

In addition to the SLT, the administrative pathway also included the governance apparatus of the Greater Manchester Low Carbon Hub (GMLCH) — a board of 13 senior-level individuals representing public, private and third sector organisations that provide the GMCA Environment Team with strategic oversight (Participant 4, personal communication; Participant 1, personal communication). The GMLCH was also not heavily involved in the 5YEP's development but gave high-level feedback and oversight to the GMCA Environment Team on decision-making (Participant 17, personal communication). The GMLCH is an official governance body within GMCA but does not have the authority to develop or implement formal policy. Although the GMLCH had no official ability to determine the 5YEP — as was the case for the SLT — the GMCA Environment Team used the GMLCH as a "sounding board" to test policy measures (Participant 14, personal communication; Participant 17, personal communication).

The policy professionals and active stakeholders engaged in the 5YEP's development through the administrative pathway did so as part of their professional roles. These individuals had a responsibility to participate in this pathway through their job. This was the one policy

development pathway that was not co-productive because it was mandated by the GMCA's organisational charter (Greater Manchester City Deal 2012; Participant 4, personal communication). Though significant primarily as a layer of bureaucratic oversight, the administrative pathway had limited impact over the decision-making of specific policy measures conceived and developed in the 5YEP (Participant 14, personal communication; Participant 17, personal communication). Although the administrative pathway had a very different position within the 5YEP's development process compared to the four co-productive pathways, it was meaningful during the policy development process.

The four co-productive pathways — the GSSG, listening events, expert workstreams, and Green Summits — and the administrative pathway each made unique and consequential contributions during the 5-Year Plan's development process. The 93 stakeholders who participated in these pathways each gained entry into the 5YEP's development process in a different way, were motivated to contribute for many reasons and influenced the 5YEP in distinctive ways. The policy professionals, active stakeholders and interested citizens that supported these pathways helped the GMCA Environment construct the 5YEP through a novel co-productive policy development approach. While the co-productive pathways were a procedural innovation for climate politics in Greater Manchester, this approach's outcomes were less distinctive from traditional urban policies in Greater Manchester.

6.3 A novel policy development approach, conventional policy outcomes

As explored throughout this chapter, the 5YEP was developed through a novel co-productive process that had some new dimensions and components compared to previous climate policy development processes the GMCA Environment Team undertook. This section of the chapter evaluates if that procedural innovation led to unpredictable, non-traditional climate policy outcomes codified in the 5-YEP. The section utilises the documentary analysis tool and key stakeholder interviews to answer this question and analyses how the co-productive pathways might have influenced policy outcomes.

When the GMCA Environment Team initially embarked on the 5YEP’s development process in the fall of 2017, they explicitly intended for the co-productive approach to determine an unconventional policy outcome (Participant 14, personal communication; Observant

Participation Field Note, 7 October 2017). The GMCA Director of Environment discussed this intention following the 5-Year Environment Plan's launch,

> "I hoped co-production would enable more people to be involved so that it (the 5-Year Environment Plan) wouldn't just be aimed at the GMCA…I wanted to try to produce the plan through something different to achieve a more transformative result. It was clear that the way that this topic has been dealt with previously in GM hasn't really worked…It was important to use co-production — something different — in order to have a chance of delivering a policy that would enable more significant results.''
> — GMCA Director of Environment, personal communication

The 5YEP was designed to be an initial policy within a longer-term framework of achieving carbon neutrality by 2038 (Observant Participation Field Note, 17 April 2018). The 5YEP was intended to be the city-region's first policy in realising its carbon neutrality aim by breaking a two-decade vision into a concrete five-year action plan that would be updated and revised after five years (Observant Participation Field Note, 16 April 2018). The 5YEP's scale of action was based on a carbon budget produced by the Tyndall Centre for Climate Change Research and called for reducing the city-region's carbon footprint by approximately 15% per annum, resulting in roughly a halving of Greater Manchester's baseline carbon emissions after the initial 5-year period (Greater Manchester Combined Authority 2019). The policy professionals and active stakeholders involved in developing the 5YEP were mostly supportive of this overarching ambition and viewed it to be a significant, progressive departure from previous Greater Manchester climate policies (Observant Participation Field Note, 17 April 2018; Participant 14, personal communication; Participant 11, personal communication). While stakeholders generally viewed the 5YEP's main ambition as innovative and nonconventional, this sentiment quickly faded once the stakeholders unpacked the 5YEP's specific policy measures.

There are 24 narrowly defined, actionable and measurable policy measures within the 5YEP. These policy measures fall within five distinct thematic areas: energy, transportation, buildings, sustainable consumption and production, natural environment, and resilience and adaptation (Greater Manchester Combined Authority 2019). 18 of the 24 policy measures are directly related to reducing urban carbon emissions, while six are targeted on related environmental priorities (Greater Manchester Combined Authority 2019). The six non-carbon

emissions policy measures fall within the natural environment and resilience and adaptation thematic areas (Greater Manchester Combined Authority 2019). Although the mayor's Mayoral Manifesto called for the creation of policy that would target reducing the city-region's carbon emissions, the GMCA Environment Team was given the flexibility when developing the policy to include other environmental priorities that they deemed related to the overarching carbon emissions reduction target (Participant 17, personal communication).

The 5YEP's 24 specific policy measures were similar to those found within a conventional Greater Manchester climate policy as the 2016 CCLEIP, a departure from the co-productive approach's aspiration. The documentary analysis tool revealed that all 24 of the 5YEP's policy measures were primarily developed utilising specialist knowledge contributed by technical practitioners. The specialist knowledge used to develop the policy measures came from expert listening events, technical analyses, consultant reports, and academic reports. Tacit knowledge was only found to support 11 policy measures. The tacit knowledge used to support or substantiate some of the policy measures were generated through listening events held with different citizen groups. While the co-productive policy development pathways successfully enabled non-traditional stakeholders to particulate throughout the 5-Year Environment Plan's development process, these perspectives were generally unable to have as significant a voice determine policy measures as conventionally engaged professionalised practitioners that hold specialist knowledge.

Over the 5YEP's development process, the innovative aspects of the co-productive policy development pathways were only codified in one instance. The Springboard Report attempted to reflect non-traditional stakeholders' perspectives that had participated through the listening events and 2018 Green Summit and advocated for unconventional policy interests. For example, the Springboard Report contained 80 specific policy measures, 15 of which were primarily developed utilising tacit knowledge provided by interested citizens through listening events. While most of the Springboard Report's policy measures were developed by policy professionals and active stakeholders, it is significant that the co-productive pathways supported unconventional voices to gain traction and become codified in an official document (Participant 9, personal communication). While the Springboard Report was not an official GMCA strategy like the 5YEP, it did go through similar bureaucratic deliberations within the administrative pathway to negotiate and approve the final document (Participant 9, personal communication; Participant 14, personal communication). The Springboard Report's policy

measures demonstrate that the co-productive approach was able to facilitate robust policy debate between diverse perspectives that were then formally recognised in an official organisational document.

As the policy development process continued after the Springboard Report was released, the types of stakeholders engaged through the co-productive pathways narrowed. The only non-GMCA stakeholders that participated in the co-productive pathways during this period were the technical experts that supported the workstreams. This meant that while the 5YEP's concrete policy measures were being developed, no unconventional stakeholders were involved in the active policy deliberations. As a result, the Springboard Report's innovative policy ambitions supported by non-traditional stakeholders were no longer being raised in policy contestations as they had previously through listening events or the 2018 Green Summit breakout zone, for example. Subsequently, there was an erasure of those unconventional policy ambitions that gained traction through policy debates fostered through inclusive co-productive pathways that occurred earlier on during the 5YEP's development process. This months-long erosion process resulted from the GMCA Environment Team's lack of capacity to facilitate the inclusive co-productive pathways within the 5YEP's development process and their prioritisation to develop technocratic policy actions.

The specific policy actions articulated in the 5-Year Environment Plan were consistent with a conventional climate strategy despite being produced through a co-productive approach. The 5YEP's 24 defined policy measures focus on actions such as incrementally scaling up local renewable energy generation using conventional funding and delivery mechanisms, phasing out private fossil fuelled vehicles to be replaced by zero emission alternatives by developing charging infrastructure, retrofitting residential and commercial building to reduce heating demands by scaling up existing programmes, improve recycling rates through encouraging behavioural changes, promoting urban foresting programmes, and more (Greater Manchester Combined Authority 2019, 24, 33, 43, 51, 60). While these and the 5YEP's other specific policy measures are meaningful, they are of a similar scale, dimension and kind as the policy measures produced in previous Greater Manchester climate strategies such as the Greater Manchester Climate Change Strategy 2011 or Climate Change and Low Emissions Implementation Plan 2016-2020 that were developed through traditional policy development processes with conventional professional policy actors (Participant 17, personal communication; Participant 21, personal communication). The Springboard Report's creative,

imaginative policy ambitions were supported by active stakeholders and interested citizens engaged through listening events and the 2018 Green Summit, but these individuals were not involved in the expert workstreams, eroding the potential for these ambitions to be codified in the 5YEP.

While the policy actions in the 5YEP resemble those found within previous Greater Manchester climate policies, there were several unconventional, transformative policy proposals produced in the Springboard Report that were supported by the GSSG, listening event and 2018 Green Summit co-productive pathways. For instance, activists, community organisers, academics and other interested citizens helped develop a proposal for a 'Greater Manchester Energy Company' raised during several listening events (Observant Participation Field Note, 2 March 2018). The proposed Greater Manchester Energy Company was an innovative, non-traditional initiative that focused on accelerating local renewable energy generation, storage and aggregation while facilitating local economic development as a publicly owned and controlled utility that would reinvest its profits into local skills training and green jobs programme (Greater Manchester Combined Authority 2018, p. 22). The Greater Manchester Energy Company was formally recognised in the Springboard Report. It was touted as an imaginative proposal that differed from comparable conventional renewable energy initiatives that traditionally focus on approaches such as assessing the viability of installing renewable energy generation infrastructure on the local government's estate or including renewable energy procurement standards in local government energy contracts (Participant 3, personal communication).

This creative policy proposal put forward in the Springboard Report directly resulted from the co-productive pathways but was ultimately removed from the 5-Year Environment Plan in favour of a more conventional policy action to "develop proposals for an investment vehicle…to deliver renewable energy generation on their (GMCA and Local Authority) estates." (Greater Manchester Combined Authority 2019, 27). The policy actors that initially developed the idea for a Greater Manchester Energy Company' no longer could participate in the policy development process following the Springboard Report's release (Participant 11, personal communication). As the stakeholders that advocated for the Greater Manchester Energy Company in listening events and the 2018 Green Summit were not engaged through the expert workstreams, this bold policy idea was not included in policy contestation that took

place in the expert workstreams, making it susceptible to erosion in the 5YEP (Observant Participation Field Note, 31 January 2019; Participant 18, personal communication).

A second example of the policy measures within the 5YEP's turning to resemble those found in an urban climate policy developed through conventional technocratic approaches can be gleaned from the issue of environmental justice and equity. In the lead up to the 2018 Green Summit, a significant theme discussed by active stakeholders and interested citizens at listening events and GSSG meetings was the notion that Greater Manchester had an ethical responsibility to factor climate justice into this policy development process given the region's historic role as a carbon emissions emitter (Observant Participation Field Note, 9 March 2018; Observant Participation Field Note, 21 March 2018). This argument successfully led the Springboard Report to include numerous provisions outlining Greater Manchester's commitment to environmental justice, both at a rhetorical level but also in the form of specific policy ambitions such as valuing sustainability above economic development in policy decision-making, considering social justice as a key element within climate policy development, and taking action to address environmental justice in Greater Manchester and beyond (Greater Manchester Combined Authority 2018, p. 32). The Springboard Report's inclusion of environmental justice and equity was a novel policy development directly facilitated by the new perspectives engaged through the GSSG, listening event, and 2018 Green Summit co-productive pathways.

While environmental justice was formally recognised in the Springboard Report, the unconventional ambition was almost entirely erased from the 5YEP. A clear example of this was the inclusion of 'cost-benefit' litmus tests added to several specific policy measures that would affect local government procurement standards. Instead of including environmental justice and social equity as fundamental principles included in sustainable procurement standards as put forward in the Springboard Report, the 5-Year Environment Plan made numerous concessions from these ideals favouring economic prosperity instead. This compromise is highlighted through several policy measures in the 5YEP where an economic qualifier has been added as demonstrated by the proposal for local authorities to "procure zero emission cars/vans where suitable and cost effective…" (Greater Manchester Combined Authority 2019, 33), and "GMCA and local authorities will aim to obtain an average DEC rating of D or better by 2024 for their public buildings where economically viable" (Greater Manchester Combined Authority 2019, 43). The 5YEP's high consideration to ensure climate

policy actions adhere to economic safeguards rather than ethical values taken in the Springboard Report was reminiscent of conventional Greater Manchester climate policy. This shift in the 5-YEP toward conventionality can be attributed to the lack of non-traditional perspectives being included in policy debates following the plan's initial design.

The 5YEP codified some meaningful, non-traditional policy ambitions that can in part be attributed to the co-productive approach and diverse perspectives brought into policy debates through these pathways. However, the concrete policy measure put forward within the plan were in large part consistent with conventional technocratic, incremental Greater Manchester climate policies. The GMCA Environment Team's co-productive approach to developing the 5YEP successfully engaged some non-traditional perspectives and created opportunities for some innovative new policy actions to gain traction, as could be seen in the Springboard Report. Despite that potential, unconventional perspectives were mostly absent from the later stages of the policy development process, leading to the Springboard Report's transformative potential to become muted in the 5YEP. Ultimately, the co-productive approach used to develop the 5YEP was unable to deliver policy actions that were distinct and innovative compared to previous Greater Manchester climate policies produced using traditional policy development methodologies.

In summary, this chapter has demonstrated that while the 5YEP was developed through a novel approach bolstered by the co-productive pathways, the procedural innovations determined policy outcomes consistent with those found in an urban climate policy developed using conventional approaches. While the GMCA's Environment Team's ambition to produce the 5YEP using an innovative approach was attained in some respects due to the co-productive pathways, the strategy's resulting policy outcomes generally fell short of the initial aspiration. The chapter finds that while there were meaningful policy actions developed through the co-productive approach, the 5YEP's overall policy outcomes are predominately consistent with conventional urban climate policy actions and the co-productive approach did not determine transformative policy outcomes. Having analysed how co-production can support urban climate policy development and its potential limits, the thesis will examine how the co-productive approach influenced the perceptions and attitudes of the stakeholders that participated in developing the 5YEP. This analysis will help the thesis determine how co-production is understood as an urban climate policy development approach and its potential consequences.

7. Expectations, perceptions & attitudes of co-productive climate policy development

Thus far in the empirical evaluation chapters of the thesis, I have examined the stakeholders, interests, and challenges involved throughout the 5-Year Environment Plan's (5YEP) development process and analysed the co-productive approach's impact on the process of developing and outcomes of the 5YEP. These two empirical chapters have evaluated how co-production was understood and applied in developing the 5YEP and examined the procedural and policy consequences and its limits in the particular context of Greater Manchester, synthesising analysis that provide insights which directly respond to the study's first two research questions . In this next empirical analysis chapter, I will evaluate the co-productive process from the perspective of the stakeholders that participated in the process. Throughout the chapter, I analyse what the stakeholders engaged in the 5YEP's development process anticipated the co-productive approach might achieve and evaluate how those expectations were realised and dissatisfied during the process. Through its analysis, this chapter enables the thesis to explore how the co-productive approach was experienced by the stakeholders engaged in the process, determining novel understandings that respond to the study's third research question – *what are the consequences of co-production as an urban climate policy development approach for local government organisations and involved stakeholders in addressing the challenges and opportunities of climate action?*

The chapter begins by exploring the GMCA Environment Team's expectations of the co-productive approach they chose to utilise when embarking on developing the 5YEP. This section also examines the perceptions that different engaged stakeholders had surrounding what the co-productive approach may have enabled. In the first section of this chapter, I evaluate what assumptions and attitudes the different individuals involved in the 5YEP's development process had of the co-productive approach and what they anticipated the approach might achieve. Next, the chapter analyses how the co-productive approach influenced the engaged stakeholder's attitudes and perceptions during policy contestation and debate. This section considers three examples during the 5YEP's development process and analyses how policy deliberation was perceived by the engaged stakeholders and the consequences of co-productive negotiation. Finally, the chapter evaluates how the co-productive approach affected power, control and leadership during the 5YEP's development. This closing section demonstrates that while the stakeholders engaged in the 5YEP's development process anticipated that the co-productive approach would support power sharing amongst those

engaged in the process, the co-productive approach was largely viewed as unsuccessful in shifting the tightly controlled power of the GMCA Environment Team.

7.1 Expectations of the co-productive policy development approach

In Chapter 6.1, I analysed four factors that shaped the GMCA Environment Team's perception of co-production. These factors — the Manchester is My Planet programme, Greater Manchester's devolution process, the GAPS research project, and Mayoral Manifesto — contributed to provide the organisation with a familiarity with co-production and developing policy through partnership approaches and, in part, served as motivation to employ co-production as an urban climate policy development approach. Furthermore, the GMCA Environment Team had additional expectations of co-production that motivated them to utilise co-production as a framework for developing the 5YEP.

The first expectation the GMCA Environment Team had for the co-productive approach was that it would be an effective mechanism for engaging the city-region's 2.7 million residents during the 5YEP's development and subsequent implementation process (Participant Observation Field Note, 12 October 2017; Participant 14, personal communication). When the GMCA was established in 2011 and agreed its 2012 City Deal with the central government, the GMCA gained some legal powers and financial resources and new layers of democratic accountability, including creating a directly elected mayor's office (Greater Manchester City Deal 2012). The devolution process impacted the GMCA Environment Team by requiring it to establish a Low Carbon Hub board to ensure climate and environment policy decision-making would have public oversight and accountability (Greater Manchester City Deal 2012; Participant 14, personal communication). Through the GMCA Environment Team's ongoing devolution process and past experiences with co-production, they believed that using a co-productive approach to develop the 5YEP would support enhanced democratic participation in policy development and enable the public to take joint ownership of eventual policy outcomes (Participant 4, personal communication).

The GMCA Environment Team anticipated that the enhanced democratic participation and accountability fostered by co-production would support developing a more robust and ambitious policy than if that policy were to be developed through a conventional technocratic

approach. The GMCA Environment Team's previous policy development experiences — particularly the 'Climate Change and Low Emissions Implementation Plan 2016-2020' (CCLEIP) — demonstrated that if the 5YEP were to achieve the goal articulated in the mayor's Manifesto of delivering meaningful carbon emissions reductions, it would need to facilitate policy actions beyond the GMCA organisation itself (Participant 4, personal communication; Participant 6, personal communication). The GMCA Environment Team believed that the co-productive approach would enable the 5YEP to promote policy actions targeting many sectors and stakeholders throughout the city-region and be recognised by the public as a 'plan for Greater Manchester' rather than a policy for GMCA (Participant Observation Field Note, 22 December 2017; Participant Observation Field Note, 12 January 2018). The GMCA Director of Environment described this anticipated outcome of utilising a co-productive approach for developing the 5YEP by stating,

> "I expected co-production would enable more people to be involved during the process so that it (the 5YEP) would be aimed at the whole city and not just GMCA. The GMCA and local authorities have very limited powers and funding in this policy area. This means that if we are going to create a policy which makes a difference, it needs to include actions that go beyond our purview…I knew that the public would want to be involved in developing this plan and the approach we took seemed an appropriate way to support the broad inclusion."
>
> — GMCA Director of Environment, personal communication

The second expectation the GMCA Environment Team had for the co-productive approach was that it would help attract resources and capacity from external organisations engaged in the 5YEP's development process. At the start of this policy development process, the GMCA Environment Team only had the personnel capacity of two full-time policy officers employed by GMCA and had access to limited organisational resources (Participative Observation Field Note, 21 December 2017). While the GMCA Environment Team had five additional policy officers in the fall and winter of 2017 when the 5YEP's development first began, these policy officers were funded through external organisations to support specific projects (Participant Observation Field Note, 1 December 2017). The GMCA Environment Team's longstanding resource and capacity limitations lead them to persistently seek new methods for generating additional forms of external support (Participant Observation Field Note, 18 December 2017). The GMCA Environment Team perceived co-production as a potential mechanism that may

facilitate external organisations becoming entrenched during the 5YEP's development and contributing their own organisation's resources and capacity to support the process.

In the spring of 2017, when the GMCA Environment Team began planning the 2018 Green Summit and developing the 5YEP, they determined it would not be possible to deliver these objectives without external support (Participant 4, personal communication; Participant 14, personal communication). There were a few options the GMCA Environment Team considered to offset their internal capacity and resource deficiencies, such as contracting external consultants but ultimately settled on pursuing co-production (Participant 4, personal communication; Participant 5, personal communication). The GMCA Environment Team anticipated the co-productive approach would foster new partnerships with external organisations that could be used to capture additional capacity support (Participant Observation Field Note, 15 December 2017). The GMCA Environment Team's lack of resources and capacity was widely recognised amongst the stakeholders engaged in the 5YEP's development process and the GMCA Environment Team anticipated the partnerships supported by the co-productive approach would encourage these external stakeholders to contribute their support during the process (Participant 9, personal communication; Participant Observation Field Note, 6 February 2018). Some external stakeholders that participated in the process identified this as one of the GMCA Environment Team's perceived co-production outcomes. As one GSSG member noted,

> "It was clear they (the GMCA Environment Team) didn't have the capacity to deliver the event and deliver the policy on their own. I would say GMCA saw this approach as a way to attract the in-kind support they required. The approach was something that came about because the particular cards they were dealt."
> — Participant 6, personal communication

In addition to the GMCA Environment Team's expectations of co-production, the stakeholders that were most directly engaged in the 5YEP's development process had their own expectations for the co-productive approach. The most engaged active stakeholders were those that supported the GSSG and expert workstream co-productive pathways. The first expectation that some of the active stakeholders anticipated the co-productive approach would achieve was accelerating the GMCA's ambition for the 5YEP. The starting aim of the 5YEP was to accelerate the city-region's target for achieving carbon neutrality as called for by the mayor's

manifesto, and some of the active stakeholders anticipated the co-productive approach could further advance the GMCA Environment Team's aspiration (Participant 3, personal communication; Participant Observation Field Note, 23 November 2017). These active stakeholders believed co-production would enable the GMCA Environment Team to access the most current research regarding the threats of climate change and technologies designed to ameliorate its effects (Participant 1, personal communication; Participant 6, personal communication). Long-term, consistent learning facilitate through co-production was believed to further accelerate the GMCA Environment Team's ambitions for the 5YEP (Participant 6, personal communication).

The second expectation active stakeholders had for the co-productive approach was that it would produce opportunities for novel perspectives to participate in the policy development process. The GMCA Environment Team had previous experience developing climate policy with technical practitioners before embarking on the 5YEP process (see Chapter 6.1 and Chapter 6.2). However, they had a relatively limited background engaging community groups, activists and citizens in past policy development processes (Participant 3, personal communication; Participant Observation Field Note, 5 February 2018). Some active stakeholders anticipated the co-productive approach would support new pathways for conventionally unengaged stakeholders to gain entry into policy development activities (Participant Observation Field Note, 12 January 2018; Participant Observation Field Note, 6 February 2018). One GSSG member described this expectation of the co-productive approach,

> "I saw the process being led in a co-productive manner as a significant way to spread out the conversation to new groups of people usually left out of the discussion. Those groups will be crucial if we're going to make the action happen. I saw the high-level aspiration of this process as trying to allow people who aren't normally involved or focused on this agenda to have a say."
> — Participant 2, personal communication

The active stakeholders that anticipated co-production would enable traditionally unengaged perspectives to become involved in the 5YEP's development process believed this form of diverse participation would support more inclusive, representative policy actions being included in the 5YEP. For instance, some active stakeholders advocated for youth and union representatives to participate in the policy development process and believed these perspectives

engaging in the process would support nonconventional issues such as intergenerational justice and skills development gaining traction in policy debates (Participant 2, personal communication; Participant Observation Field Note, 9 November 2017). Some active stakeholders anticipated the co-productive approach would create opportunities for new perspectives to engage in the policy development process, leading to novel policy issues becoming centred in the 5YEP's development.

The GMCA Environment Team aimed to develop the 5YEP through a co-productive approach with the intention for the process to determine policy outcomes distinct from those cultivated through conventional policy development approaches. While co-production was intended to facilitate novel policy outcomes, the GMCA Environment Team and the stakeholders most engaged in the process had different expectations and perceptions about what the co-productive approach might achieve. For the GMCA Environment Team, co-production was perceived as a mechanism that could facilitate enhanced forms of democratic participation in policy development and support resource and capacity contributions from external organisations engaged in the process. Meanwhile, the stakeholders most engaged in the process anticipated the co-productive approach would accelerate the ambitions of the 5YEP and enable diverse, non-traditional perspectives to gain traction in policy development. Having evaluated the expectation different stakeholders had for the co-productive policy development process, I now analyse how the co-productive approach impacted the engaged stakeholders' perceptions and attitudes during policy debate and contestation.

7.2 "Critical friends until critique": Dealing with tension and contestation

The literature widely claims that co-productive arrangements can support vigorous debate, friction and negotiation amongst different individuals as they work collaboratively toward shared objectives (see Voorberg, Bekkers & Tummers 2015; Brandsen & Pestoff 2006). Above, I analysed that the GMCA Environment Team and stakeholders involved in the 5YEP's development process also anticipated co-production to support new forms of deliberation and negotiation. There were several examples during the 5YEP's development process where tensions emerged between the participating stakeholders and their different positions were contested through the co-productive approach. Conflict, contestation and debate are essential elements within climate policy development and can potentially support productive and

meaningful climate policy development (Fischer 2017; Chapter 2.3). In this section, I will evaluate how policy contestation and debate supported through the co-production approach were perceived by the different stakeholders involved in deliberations.

Although the GMCA Environment Team anticipated the co-productive policy development approach would generate resources and capacity from external organisations as analysed above, they also perceived co-production would support new forms of democratic participation in climate policy development. The GMCA Environment Team anticipated the co-productive approach would enable a diverse range of stakeholders with different forms of knowledge to participate in policy deliberations that could collectively develop the 5YEP (Participant Observation Field Note, 20 February 2018; Participant Observation Field Note, 24 July 2018). The GMCA Environment Team intended to create the various co-productive pathways to, in part, support these policy dialogues between various types of stakeholders (see Chapter 6.2). Climate change is inherently a risky, contentious area of politics, leading climate policy deliberations to confront tensions between different perspectives (see Chapter 2.1). Below, I analyse three instances during the 5YEP's development process where the contentiousness of climate policy manifested and examined how conflict through the co-productive approach was perceived.

The first example of conflict during the 5YEP's development process that I will evaluate took place during the 17 October 2017 GSSG meeting. As discussed in Chapter 5.2, the notion of 'sensitive issues' was a concept that was initially introduced during this GSSG meeting, relatively early on in this policy development process. During this GSSG meeting, there was a lengthy discussion about how the policy development process could effectively address contentious policy areas that came to be colloquially labelled "sensitive issues" (Participant Observation Field Note, 17 October 2017). Sensitive policy areas were challenges perceived as particularly politically precarious, making them delicate to discuss but significant to broach due to their high carbon impact and public prominence (Participant Observation Field Note, 17 October 2017). Sensitive issues were first discussed during this October 2017 GSSG meeting and had an enduring visceral impact on numerous GSSG members throughout this policy development process.

Several GSSG members discussed at the October 2017 GSSG meeting the importance for this policy development process to not shy away from politically challenging yet consequential

policy areas including the Manchester Airport and its expansion, Greater Manchester Pension Fund (GMPF) and Greater Manchester Spatial Framework (GMSF) (Participant Observation Field Note, 17 October 2017). The active stakeholders presented these three specific policy areas as critical for the 5YEP to consider because of their high carbon impact and the public sector's relatively high degree of influence over these issues (Participant Observation Field Note, 17 October 2017). All of the policy professionals and active stakeholders present at the October 2017 GSSG meeting agreed that these sensitive issues should be addressed during the 5YEP development process, but at a later date once more simple policy areas had been deliberated (Participant Observation Field Note, 17 October 2017). While an informal commitment was made by the GMCA Environment Team to openly address sensitive issues through the policy development process, these policy areas ultimately received little substantive deliberation (Participant Observation Field Note, 17 October 2017; Greater Manchester Combined Authority 2019). There were multiple attempts made by active stakeholders involved in the co-productive policy development process to confront sensitive issues during later GSSG meetings, in listening events, through the expert workstreams, and at both Green Summits (Participant Observation Field Note, 22 December 2017; Participant Observation Field Note, 11 December 2018; Participant Observation Field Note, 21 March 2018; Participant Observation Field Note, 25 March 2019). However, the 5YEP made no formal pronouncement on any sensitive issue and the co-productive approach never enabled meaningful contestation to occur on sensitive issues (Greater Manchester Combined Authority 2019).

Several active stakeholders expressed feeling dissatisfaction and despondent when reflecting about how they felt the co-productive approach supported engaging the tensions that surrounded sensitive issues (Participant 3, personal communication; Participant 16, personal communication; Participant 21, personal communication). For instance, one GSSG member reflected after the release of the 2018 Springboard Report that it was unsurprising that sensitive issues were not meaningfully debated, but they were pleased these areas were being periodically approached (Participant 3, personal communication). The participant went on to say that,

> "Years ago, no one could mention the airport or (GM) Pension Fund in these kinds of settings…I have no illusions that we'll be able to come to an agreement where we will be able to make strong recommendations on these areas. But we'll never be able to close

> the airport or force the (GM) Pension Fund to divest from fossil fuels like I believe needs to happen unless we are able to have these kinds of honest debates. It's a small victory but I think this small progress that resulted from the approach that was taken is an important step in the right direction."
> — Participant 3, personal communication

The sentiment expressed by the active stakeholder above was shared by other GSSG members that were mildly encouraged by the co-productive approach's ability to enable new deliberative spaces policy debate on important topics that had previously been ignored by GMCA policy officers (Participant 7, personal communication; Participant 18, personal communication). Other GSSG members that also perceived the 5YEP's development process to provided increased deliberative capacity though modest new opportunities for policy contestation viewed the co-productive approach as a critical enabler of this development (Participant 7, personal communication; Participant 8, personal communication). However, these opportunities for constructive policy negotiation were stymied by GMCA's power over the process and resulting restraint of some of the pathways that could have fostered increased contestation. GMCA possessed stark power throughout the process to determine what policy debates they would open up space for genuine debate and contestation as well as the policy issues they deemed 'off the table' for co-productive deliberation (Participant 18, personal communication; Participant Observation Field Note, 8 January 2019). Although some GSSG members and other active stakeholders expressed frustration that the 5YEP's development process was unable to determine clear outcomes on sensitive issues through robust policy debate, many were modestly encouraged that these topics were at least discussed (Participant 1, personal communication; Participant Observation Field Note, 25 March 2019; Participant 16, personal communication).

The weak form of policy contestation that surrounded sensitive issues left some active stakeholders doubtful that the co-productive approach could facilitate the forms of effective policy debate needed to impact these contentious issues (Participant 7, personal communication; Participant 18, personal communication). Although the co-productive process did create opportunities for some meaningful policy negotiation, it did not allow for these issues to be contested and deliberated to the degree necessary to produce substantively distinct policy outcomes (Participant 9, personal communication). This example of how conflicts related to sensitive issues were dealt with through the co-productive approach demonstrates

that while co-production may have opened up new space for meaningful policy discussions, it was unsuccessful in creating opportunities for deliberation that could determine unconventional policy outcomes. This outcome can, in part, be explained by the active stakeholders' lack of power to shape or steer the policy development process that was narrowly controlled by GMCA Environment Team. For the co-productive policy development approach to have facilitate novel and potentially transformative policy outcomes, power would have had to be distributed more evenly between the engaged actions to support meaningful negotiation on the contentious dimensions within urban climate politics.

The second example of how active stakeholders perceived conflict during the 5YEP's development process took place within the co-productive expert workstream pathway. As I analysed in Chapter 6.2, the GMCA Environment Team engaged technical practitioners during the expert workstreams to debate specific policy challenges raised through the Springboard Report and co-develop policy actions together utilising their specialist knowledge and experience. One challenge the GMCA Environment Team posed to the energy and building expert workstreams was how individual practitioners should be defined and differentiated into the energy or building workstream that most accurately aligned with their backgrounds (Participant 18, personal communication; Participant 7, personal communication). The GMCA Environment Team determined loose parameters to sort the technical practitioners into the different workstreams, but once the workstreams began, several active stakeholders grew frustrated because they were placed in a particular workstream they felt was misaligned for their skillset (Participant 18, personal communication; Participant 11, personal communication). The expert workstreams were intended to negotiate and contest policy challenges presented in the Springboard Report across thematic disciplines and some active stakeholders were frustrated that this co-productive pathway ended up supporting contestation through the conventional narrow silos found within traditional climate policy development (Participant 4, personal communication; Participant 13, personal communication).

During the second building expert workstream meeting on 29 November 2018, the collection of technical experts in the room debated a policy challenge presented by the GMCA Environment Team differently than the policy officers had anticipated (Participant 19, personal communication; Participant Observation Field Note, 29 November 2018). The technical practitioners were asked to determine a set of policy options the GMCA could potentially enact within the 5YEP that would support the development of a local retrofit market for private sector

housing (Participant Observation Field Note, 29 November 2018). However, the technical practitioners disagreed with the premise of the GMCA Environment Team's challenge became, as they argued, framing the issue of retrofitting through the narrow lens of the private housing retrofit market would limit the possibility to scale up action and capture potential co-benefits (Participant Observation Field Note, 29 November 2018). As the contested discussion progressed beyond the scope that the GMCA Environment Team intended, the technical practitioners were asked to refocus the negotiation on the defined challenge (Participant Observation Field Note, 29 November 2018). This created tension between the GMCA Environment Team and the technical practitioners (Participant 18, personal communication; Participant Observation Field Note, 29 November 2018).

The GMCA Environment Team eventually conceded to the technical practitioners' position and encouraged debate to consider potential retrofit policy measures in response to the Springboard Report's challenge through a cross-sectoral perspective (Participant 4, personal communication; Participant 18, personal communication). Once GMCA Environment Team had navigated this tension and agreed to let the technical practitioners address the challenge how they saw appropriate, the expert workstream was able to creatively leverage their specialist knowledge to develop the 'Greater Manchester Retrofit Accelerator' (Participant 19, personal communication; Participant 18, personal communication). The GMCA Environment Team took this policy measure forward and formally committed to supporting it in the 5YEP (Greater Manchester Combined Authority 2019, 45). Following this outcome, the active stakeholders involved in this conflict perceived the expert workstream and its co-productive ambition as a positive catalyst for conceptualising traditionally narrow policy challenges through dynamic, intersectional approaches that may determine new outcomes (Participant 18, personal communication). One of the active stakeholders involved in this policy debate described the conflict, stating,

> "I was very frustrated that the (GMCA) Environment Team tried so hard to shut down our idea. They have been open to debate throughout this process and were honest about their position. That has enabled me and the others to bring our problem-solving mindsets to the table and go head-to-head with the…I feel like it was a small victory that we were able to persuade the policy officers and get the (Greater Manchester) Retrofit Accelerator into the 5-Year Environment Plan."
>
> — Participant 18, personal communication

Overall, this example of conflict within the expert workstreams demonstrates that the co-productive approach had some potential to mediate tensions during the policy development process in a manner that endeavoured to determine innovative outcomes, as was shown through Greater Manchester Retrofit Accelerator. This example of conflict during the 5YEP's development process did not have to inevitably support the Greater Manchester Retrofit Accelerator's positive development because the GMCA Environment Team could have decided to use their position of power and leadership to limit policy deliberation. However, in this particular case, the co-productive approach successfully mediated new policy agendas through a conflict.

The last example of how conflict was perceived and influenced the policy development process through the co-productive approach stems from an 8 January 2019 GSSG meeting. At this GSSG meeting, the GMCA Environment Team presented a draft version of the 5YEP that they would present to the GMCA Senior Leadership Team (SLT) two weeks later (Participant Observation Field Note, 8 January 2019). This presentation was intended to provide political leaders with the most up to date version of the SCATTER tool and propose a set of policy options that had been developed and would require public investment (Participant Observation Field Note, 8 January 2019). The GMCA Environment Team decided to share two scientific models in this draft presentation to the GSSG (Participant Observation Field Note, 8 January 2019). The first model, SCATTER, was familiar to the GMCA SLT as they had been occasionally briefed on it over the previous 16-months, while the second tool, ESME, was a newly developed tool and unknown to the GMCA SLT (Participant Observation Field Note, 8 January 2019).

After the GMCA Environment Team had presented both SCATTER and ESME to the GSSG, the active stakeholders expressed concern over both scientific models being shared with the GMCA SLT and sparked a contentious debate. The GSSG members were apprehensive about both models being shared with the GMCA SLT because each tool was based on a different set of assumptions and data, requiring nuanced comprehension to evaluate (Participant Observation Field Note, 8 January 2019). The political leaders who constituted the GMCA SLT did not have specialist knowledge about climate science which could have led them to misunderstand each model's outcomes (Participant 12, personal communication). The GMCA Environment Team comprehended the sentiment of those that raised their concerns over the

presentation but did not initially agree to present only the SCATTER or ESME model to the GMCA SLT (Participant Observation Field Note, 8 January 2019). Despite the GMCA Environment Team's visible lack of interest in engaging in this debate, about a third of the GSSG members determinedly continued the contested discussion (Participant Observation Field Note, 8 January 2019). One active stakeholder reflected in an interview after this GSSG meeting that they perceived this contentious debate as a decisive moment that tested the process's commitment to co-production (Participant 20, personal communication). That individual noted,

> "There was a clear intimation from the policy officers that the ESME model would be more amenable to the political leaders because it…would allow us in Greater Manchester to take significant action more slowly rather than immediately…It was made very clear to the policy officers in the room that the ESME model was based off incomplete assumptions at best and would implicitly shepherd leaders towards policies that went against all of the information that was gathered through the public engagement process we had been working on for over a year."
> — Participant 20, personal communication

Following this contentious debate in the GSSG meeting, the GMCA Environment Team agreed to remove the ESME model from their presentation to the GMCA SLT (Participant 17, personal communication; Participant 14, personal communication). Several active stakeholders who argued for removing the EMSE model described feeling reassurance after the GMCA Environment Team made this decision (Participant 10, personal communication; Participant 20, personal communication). This example highlights that the co-productive approach provided a useful 'check and balance' on the GMCA Environment Team and helped support robust decision-making. In this instance, the GSSG co-productive pathways enabled the GMCA Environment Team to reach the most effective decision and not what is most expedient. Furthermore, this conflict was perceived by some active stakeholders, that although tension during the 5YEP's development process may have been difficult and uncomfortable to navigate, the co-productive approach could navigate conflicts and determine well-thought-out outcomes.

The 5YEP's development process was rife with conflict and tensions between the different groups of engaged stakeholders. The GMCA Environment Team encouraged the different

types of stakeholders to fulfil the role of ‘critical friends’ through the co-productive approach to stoke contentious policy debate that would ultimately determine rigorous policy outcomes. Co-production is widely credited to support robust debate and negotiation between different perspectives. The analysis in this section evaluated how co-production facilitated policy negotiation that led to particular outcomes. This section also illustrated that these conflicts were generally perceived by the stakeholders engaged in the co-productive process to determine positive outcomes, though not without their shortcomings and challenges. Having evaluated the perceptions different stakeholders had about conflict and tension during the co-productive policy development process, the next section will analyse how the co-productive approach influenced stakeholders' perceptions of leadership, control and power.

7.3 Leadership, control & power

There is broad discussion about how the concepts of leadership, control, and power can influence decision-making arrangements in urban climate governance and co-production literatures (see Bulkeley & Betsill 2013; Bussu & Tullia Galanti 2018; Joshi & Moore 2004). While leadership, control, and power are important elements that can influence co-productive and policy development processes, they are infrequently made explicit during these processes (Farr 2018). Throughout the 5YEP's development process, all three of these concepts had a consistent and implicit presence. In this concluding section of the chapter, I analyse how leadership, control, and power manifested through the 5YEP's co-productive policy development approach. This analysis enables the thesis to examine how co-production may affect some of the fundamental influencing factors of climate policy development that were examined in the conceptual framework and explore its potential limits.

According to numerous active stakeholders and interested citizens, leadership was an important feature throughout the 5YEP's development process (Participant 3, personal communication; Participant 10, personal communication). These individuals loosely described leadership as 'the who' or 'the what' that identified the 5YEP's primary objectives, those responsible for creating the framework for achieving these objectives, those developing the structure for individuals and organisations to engage in supporting the policy development process, and how those involved would be held accountable for delivering particular objectives of the process (Participant Observation Field Note, 8 January 2019; Participant Observation Field Note, 26 June 2018; Participant 9, personal communication). In this instance, leadership was a

characteristic perceived to fundamentally support bringing different groups of stakeholders together around a shared vision (Participant 17, personal communication; Participant Observation Field Note, 8 January 2019).

The involved stakeholders perceived ‘the who’ and ‘the what’ that provided leadership throughout the 5YEP's development process delineated into two distinct groups. The first group were the GMCA Environment Team policy professionals who viewed the mayor as being the primary source of leadership (Participant 4, personal communications; Participant 17, personal communication; Participant Observation Field Note, 25 January 2019). They saw the mayor as a figure who provided convening influence and strategic direction during the policy development process, particularly by establishing the process's central objective identified in his election manifesto (Participant Observation Field Note, 25 January 2019; Participant 5, personal communication). Despite the mayor's lack of personal involvement, the GMCA Environment Team described him to be the principal source of leadership throughout this process. One GMCA Environment Team policy officer noted this,

> “I would argue that despite Andy being personally hands off for most of this process, it wouldn't have happened without him. His Manifesto set the agenda. His platform and microphone as Mayor made other organisations and even citizens take notice of this process and have desire to get involved. The Mayor’s position within GMCA was also critical for providing leadership over other teams but also by giving a sense of direction on the topic to the other leaders.”
> — Participant 4, personal communication

The second group, which encapsulated all of the other active stakeholders, believed the GMCA Environment Team — particularly the GMCA Director of Environment — was the primary sour of leadership throughout this process. This group included active stakeholders and interested citizens that hosted event hosts, participated in the expert workstream, and sat as members of GSSG. The group also viewed the GMCA Environment Team's leadership role to have included developing and instituting the framework through which this policy development process took place (Participant 16, personal communication). This group of stakeholders believed the co-productive policy development approach enabled the GMCA Environment Team to overtly take a leadership role rather than the political leaders who traditionally are perceived as the source of leadership (Participant Observation Field Note, 8

January 2018; Participant 17, personal communication). The active stakeholders perceived the GMCA Environment Team's leadership position as opaque, difficult to discern what decisions were made based upon the policy professional's own beliefs versus those decisions that emanated out of their internalisation of the political leaders' positions (Participant 18, personal communication; Participative Observation Field Note, 6 February 2018).

Power was a fundamental and dynamic aspect of the co-productive policy development approach. While the active stakeholders had no shared definition of power, they generally discussed this as the relative ability of an individual or organisation to influence and impact the policy development process (Participant 13, personal communication; Participative Observation Field Note, 25 July 2018). The active stakeholders described power as closely connected to and reflective of an individual or organisation's ability to exert procedural influence during decision-making processes (Participative Observation Field Note, 6 February 2018; Participative Observation Field Note, 15 March 2018). This, can also be understand as the ability of a given actor to use their 'power over' the process to influence its outcomes, in a way which may be contrary to the interests of other actors (Lukes 2004). Power, as conceived by the active stakeholders, was a concept that could be possessed and exercised by a narrow set of interests rather than shared between a wide constellation of actors. This notion of power is in contrast to its aspirational depiction in co-production literature which describes power as a distributed quality amongst the actors involved in the co-production process (see Chapter 3).

The active stakeholders generally perceived power during this process as operating across two dimensions. The first was the narrow 'power over' the process. This dimension of power was tightly held by the GMCA Environment Team who ultimately could exert their influence to shape a given decision to reflect their interests, regardless of what other active stakeholders advocated for (Participant 14, personal communication; Participant 4, personal communication). Most active stakeholders did not perceive the GMCA Environment Team to have malevolently wielded this dimension of power to coerce other active stakeholders to adopt their particular interests or positions during the process (Participant 17, personal communication; Participant 20, personal communication). Rather, this power over the process was used by the GMCA Environment Team to shape what sets of issues could gain attention, deliberation and traction within the final policy outcomes and what sets of interests were left off the table. This usage of power over the process resulted in the GMCA Environment Team's primarily interests being reflected in the final policy outcomes.

The second dimension of power was the ‘power to’ influence the process in more subtle ways. Power to influence the policy development process was generally perceived as a form of power granted by the GMCA Environment Team and could be accumulated in three ways. First, was the relative level of resource an individual or organisation contributed towards the policy development process (Participant 8, personal communication; Participant 18, personal communication). If, for example, an active stakeholder was able to provide financial resources and personnel capacity to support a particular activity, that active stakeholder gained outsized power in the process because of their ability to deliver tangible action (Participant 18, personal communication). The second form of power to influence the process emanated from an individual's professional seniority level within their organisation and ability to mobilise their organisation to take a specific action (Participant 9, personal communication; Participant 20, personal communication). Several individuals discussed this dimension of power critically by describing it as a superficial characteristic that highlighted one's salary or profile rather than a measure of one's knowledge, skill, or ability (Participant 3, personal communication; Participant 16, personal communication). The third aspect of power to influence the process was described as the networks each stakeholder had access to and could leverage toward a specific aim (Participant 7 personal communication: Participant 13, personal communication). Every stakeholder involved in this process had access to different networks, and their ability to mobilise those networks for specific objectives increased their level of power.

Each active stakeholder's relative power to influence the process changed throughout the 5YEP development process. At different junctures during the process, particular skills, expertise, capacity, connections, and other forms of support were required to confront an obstacle within the policy development process (Participative Observation Field Note, 12 January 2018). This meant that the distribution of power was, in part, determined by the immediate focus of the policy development process. The shifting nature of power was perceived as a positive function of the co-productive approach because it enabled different stakeholders to grasp power throughout the process rather than being tightly controlled by a few stakeholders. A listening event host and GSSG member discussed this,

> "In processes like this one, it's typical for an organisation with deep pockets and a high profile to have outsized influence and power placed upon them whether they should have it or not based on merit. Generally, that was not the case in this instance. Power

> was gained by an individual's ability to deliver something that was needed at the time. Power in each given instance was earned. This meant power could be held by a traditional source or a small group that would typically be powerless during this type of process could actually gain power if they were in the right place to make an impact." — Participant 16, personal communication

Control was the third co-concept within this climate policy development process that co-production influenced. The involved stakeholders discussed control as the amount of force and ability an organisation had to assert its position over others (Participant 10, personal communication; Participative Observation Field Note, 7 February 2019). Control was perceived more negatively than either leadership or power. While the involved stakeholders perceived the co-productive approach to have influenced leadership and power during the policy development process, they perceived co-production as having a much weaker influence on control (Participant 24, personal communication; Participant 13, personal communication; Participant 7, personal communication).

The active stakeholders and interested citizens perceived the GMCA Environment Team and GMCA SLT to have had held a tight grip on control throughout the policy development process (Participative Observation Field Note, 17 October 2017; Participative Observation Field Note, 15 March 2019). The active stakeholders believed the GMCA Environment Team and SLT maintained control because they would ultimately be held responsible for the 5YEP's policy outcomes and wanted to ensure they could deliver those outcomes (Participative Observation Field Note, 8 January 2019; Participant 21, personal communication). If the co-productive approach had enabled the GMCA Environment Team and SLT to relinquish their control over the process, they would have opened themselves up to the potential risk of ratifying policy outcomes they could not achieve (Participant 14, personal communication; Participant 17, personal communication).

Leadership, power, and control were influential concepts during the 5YEP's development process and important elements of urban climate policy development. The involved stakeholders perceived the co-productive approach to have influenced these factors, particularly leadership and power. While the analysis demonstrates co-production has some influence on leadership, power, and control were perceived and utilised by the involved stakeholders, the impact of co-production appears to have most concretely affected how

leadership was distributed and how power was wielded during 5YEP's development process. However, the analysis also has shown that co-production in this instance did not achieve some of its theoretical claims that were evaluated in the conceptual framework, such as facilitating citizen empowerment, decentralising sources of leadership, or distributing decision-making control co-equally between the stakeholders involved in this process. While some of the literature's claims surrounding co-production did have an impact on leadership, power, and control during the 5YEP's development process, that influence was limited. Following this analysis, I will now reflect on my role during the 5YEP's development process through the embedded research position and analyse how this role impacted the co-productive approach.

8. Intermediation & Illumination

Throughout this thesis's empirical section, I have investigated and evaluated the co-productive approach the Greater Manchester Combined Authority (GMCA) used to develop the 5-Year Environment Plan (5YEP). The empirical section began by analysing the 5YEP's complex two-year development process and examined the stakeholders, agendas, and interests involved. Next, I evaluated the co-productive pathways that supported the policy development process and assessed how the co-productive approach facilitated some procedural innovations but struggled to determine novel policy outcomes. Finally, I analysed the expectations different stockholders had for the co-productive approach and explored some of the literature's claims of co-production against what took place. These first three empirical chapters systematically supplied analysis which sought to respond to the study's three research questions. This final chapter of the empirical section reflects on my role during the 5YEP to analyse how my actions through the embedded research position influenced and informed the co-productive approach. By evaluating my role within the 5YEP's development process traversing a 'boundary space' as an embedded researcher and participant in that process, the chapter examines the practicalities of co-productive climate policy development in this particular research setting and explores insights generated from that embedded perspective. Furthermore, the chapter directly responds to study's third research objective – *to make a distinct contribution to scholarship and practice by applying and reflecting on the process of attempting to employ co-productive urban climate policy development* – and in doing so, supplies deeper analysis that is pertinent to all three of the study's research questions.

I begin this chapter by reflecting upon the different roles I had during the 5YEP's co-productive development process through the embedded research position. In Chapter 4.4, I determined my purpose in the embedded research position was that of an *active intermediary* (see May & Perry 2010) and I now examine the various dimensions of my active intermediary role. Next, I consider how I impacted the policy development process through these functions as an active intermediary by analysing my *reflexive praxis* — the process of deconstructing how my thoughts accorded with reality. Lastly, I analyse my role within the co-productive policy development process across the axis of insider-outsider perspectives. The embedded research position located me in a 'boundary space' that traversed the insider-outsider dichotomy, enabling me to facilitate action from a particular position.

8.1 An embedded researcher & active intermediary: Reflecting on influence

I actively participated during much of the 5YEP's development process through the embedded research position (see Chapter 4.4). Thus far in the thesis, I have analysed my actions within the embedded research position alongside policy professionals, active stakeholders and interested citizens who also participated in the 5YEP's development process. The embedded research position was intentionally designed to enable this study to generate learning and knowledge through the actions I took (see Chapter 4.4). Additionally, the embedded research position situated me to be an intermediary for the co-productive approach. Therefore, it is crucial to reflect on my particular actions and presence that have influenced the co-productive approach used to develop the 5YEP and examine what this has meant for the overall co-productive policy development process.

I supported an array of activities in the embedded research position as I have evaluated throughout the thesis. These actions can be categorised into three distinct roles of the larger active intermediary role — capacity building, collaborating, and engaging (Michaels 2009). These roles have been discussed as potential undertakings that embedded researchers and active intermediaries can facilitate (Bruce & O'Callaghan 2016; May & Perry 2010). I will explore these specific roles and my influence within them using the Williams 2017 integrated evaluation framework (see Chapter 4.6). By reflecting on the capacity building, collaborating and engaging roles of the active intermediary role, this section analyses how I contributed and influenced the co-productive approach used to develop the 5YEP.

8.1.1 The capacity builder

The first role I had within the activity intermediary function during the 5-YEP's development process was what I refer to as a 'capacity builder'. Capacity building is an essential role embedded researcher can facilitate and highlights their ability to increase the capabilities of the people, organisations and institutions they support to undertake activities required of them (Bruce & O'Callaghan 2016; Michaels 2009). Capacity building is an activity where the active intermediary seeks to address the limitations and abilities of those they support (Bruce & O'Callaghan 2016). I supported capacity building during the 5YEP's development process by enabling the co-production participation pathways to take place, a function the GMCA

Environment Team would not have supported with their internal capacity given their capacity constraints and prioritisation for those capacities (Participative Observation Field Note, 20 November 2017; Participant 4, personal communication).

The first influence I made through the capacity building function — enabling the participation pathways — refers to the knowledge and resources I contributed to plan, organise, coordinate and facilitate some of the co-productive pathways that supported the policy development process. My primary responsibility to the GMCA Environment Team through the embedded research position was to support and facilitate the co-productive pathways that took place throughout the 5YEP's development process (2017 Memorandum of Understanding, Greater Manchester Low Carbon Hub; 2018 Memorandum of Understanding, Greater Manchester Low Carbon Hub). The GMCA Environment Team believed that they lacked the internal capacity needed to facilitate novel forms of public participation through the co-productive policy development approach (Participative Observation Field Note, 12 October 2017). To counteract their perceived capacity limitations, the GMCA Environment Team wanted to leverage their relationships with external partners to draw in external capacity support that could enable these public participation activities, including partnering with the University of Sheffield to develop an embedded research position that could build capacity for co-production (Participative Observation Field Note, 12 October 2017). Consequently, the capacity building role within the active intermediary function was a feature that the embedded research position was designed to fulfil.

Within my capacity building role, I helped facilitate several of the co-productive participative pathways during the 5YEP's development process. An example of this can be gleaned from my previous analysis of a 17 October 2017 Green Summit Steering Group (GSSG) meeting where the GMCA Environment Team shared their intention to hire a consultant to facilitate six listening events with technical practitioners (see Chapter 6.2). Several GSSG members expressed a desire for additional listening events intended to engage a diverse audience from the public, beyond the narrow perspectives of technical practitioners (Participative Observation Field Note, 17 October 2017). The GMCA Environment Team responded that they did not have the capacity or resources to facilitate these additional listening events and lacked the knowledge and networks to design engagement activities targeting non-experts (Participative Observation Field Note, 17 October 2017). However, the GMCA Environment Team

concurred with the GSSG and jointly agreed to develop an approach for expanding the scope of the listening events to enable broader perspectives engaging in the process.

The GMCA Environment Team determined that the consultant hired to facilitate the six listening events with technical practitioners and I would collaboratively design a more inclusive framework for the listening events following the GSSG discussion (Participative Observation Field Note, 7 November 2017). The consultant and I worked collaboratively to co-design a listening event facilitation pack supplied with the information needed to organise and facilitate listening events with any audience. When the listening events began, I facilitated 18 out of the 42 total listening events with youth groups, grassroots political activists, and interested citizens (Observant Participation Field Note, 9 March 18). The consultant and I also analysed data from all of these listening events and synthesised the findings in an assessment report produced for the GMCA (Observant Participation Field Note, 9 March 18). Through my active intermediary position, the capacity building role enabled the listening event co-production pathway to engage diverse perspectives from the public (Participant 4, personal communication).

It is likely that the co-productive pathways would have engaged a narrower, professional audience who primarily possessed specialist knowledge if I had not supported the capacity building role through the embedded research position. The GMCA Environment Team prioritised engaging stakeholders through the co-productive pathways who they considered to be ‘experts’, leading them to dedicate their limited resources and capacity to focus narrowly on practitioners (Participative Observation Field Note, 26 June 2018). Using my capacity building role as an active intermediary allowed me to negotiate between the GMCA Environment Team's priorities for the co-productive approach that they, at least rhetorically, intended to facilitate new forms of civic engagement during the 5YEP’s development process (Participative Observation Field Note, 5 February 2018). My capacity building role and ability to navigate the priorities and objectives of the GMCA Environment Team led me to produce some first order product, capacity and network effects during the 5YEP's development process (see Figure 12). Additionally, the active intermediary's capacity building role allowed me to facilitate and orient the co-productive pathways to engage diverse perspectives that supported some second order policy and organisation effects.

In addition to enabling the co-productive pathways, my capacity building function also influenced the 5YEP's development process by provoking a co-productive culture within GMCA Environment Team practices. This impact describes my subtle influence developing a co-productive ethos within the GMCA Environment Team through my presence, communication and actions. The GMCA Environment Team had some familiarity with co-production after participating in research projects focused on the concept but had not embedded the ideals of co-production within their internal practices and relationships with external partners (Participant 5, personal communication; Chapter 6.1). Using the embedded research position, I built traction within the GMCA Environment Team's internal processes for co-productive (Participative Observation Field Note, 2 March 2018; Participative Observation Field Note, 22 November 2018). My influence developing a co-productive culture within the GMCA Environment Team was a predictable facet of the capacity building role of the active intermediary function because the embedded research position was negotiated and designed with the ambition to facilitate some long-term procedural changes within the Team following the culmination of this research (Participative Observation Field Note, 23 January 2018).

A meaningful example of this influence that I made through the capacity building function can be evaluated through the GMCA Environment Team's moderately altered perspective of the relative significance of different forms of knowledge. When I initially entered the field, the GMCA Environment Team had limited familiarity engaging with stakeholders who were not technical practitioners from the energy, waste, building and natural environment sectors (Participative Observation Field Note, 3 November 2017). The GMCA has changed as an institution since signing its 2012 City Deal, becoming a more political and public-facing organisation as it has gained new legal powers and resources and a directly elected mayor's office (see Chapter 5.1). This has compelled the GMCA Environment Team to change its internal bureaucratic, administrative culture to become more dynamic and transparent (Participant 17, personal communication). Furthermore, this cultural shift has promoted the GMCA Environment Team to engage wider stakeholder groups that possess tacit knowledge, raising new questions for the Team internally about the need to recognise different forms of knowledge in decision-making (Participative Observation Field Note, 17 April 2018; Participant 8, personal communication). The GMCA Environment Team's moderate cultural changes instigated by the organisation's devolution process has, in large part, spurred their interest in developing a co-productive culture and supported my ability to create this impact through the active intermediary role.

Figure 12. Effects from the Capacity Building Role

Drawn from Willaims 2017

Order Effect:	Category of Effect		
Began as 1st Order Effect	<u>Products</u> • Listening Event organiser pack • Listening event informational flyer & communication materials • Listening Event Slide Pack • Listening Event Analysis Report • Expert workstream workshops • 2018 Green Summit Break Out Room facilitator pack • 2018 Green Summit Break Out Room visuals	<u>Capacity</u> • GMCA Environment Team changed some ways of working (sending draft materials to 'key stakeholders' for comments, etc.) • GMCA broadening perspective of who's knowledge is legitimate & meaningful for policy development	<u>Networks</u> • Some GMCA stakeholder networks have expanded beyond 'usual' partners & experts • Newly identified stakeholders added to existing networks • New and better uses of network expertise and knowledge
Led to some 2nd order effects	<u>Policy</u> • Some perspectives considered in the policy agenda • Some new knowledge distribution pathways considered in policy development	<u>Organisation</u> • Evolution of public participation structures from the success of pathways used to development 5 Year Plan (GM Environment Forum, 5YEP Challenge Groups)	

As an active intermediary, I influenced the co-productive approach used to development the 5YEP through my capacity building role. This capacity building role enabled me to facilitate some of the co-productive pathways, expanding the perspectives that were able to participate in policy debates and support decision-making. Furthermore, this function enabled me to build traction for a co-productive culture within the GMCA Environment Team's internal practices, creating new opportunities for diverse forms of knowledge to be recognised and considered in policy development. The active intermediary's capacity building role led to some short-term first order effects such as expanding policy development networks to include new stakeholders and identifying better uses for the knowledge of existing networks. I was also about to achieve medium-term second order effects, particularly organisational effects by helping to establish new public participation structure. These effects I made through the capacity building role influenced the co-productive policy development process.

8.1.2 The collaborator

The second role I had as an active intermediary during the 5YEP's development process was as a 'collaborator'. This role describes the capacity I brought to this process through the embedded research position used to enhance collaboration and foster engagement from diverse perspectives during the policy development process. Collaboration demands those involved in a given process think beyond their individual expertise and self-interests to consider how their knowledge can be juxtaposed with others' expertise towards achieving common aspirations (Michaels 2009). Embedded researchers have the ability to draw from their situated academic specialist knowledge to support new forms of collaboration within their host institutions (Michaels 2009; Bruce & O'Callaghan 2016). Active intermediaries additionally have the skills and resources to strengthen the ties between fragmented groups to work towards collective benefits by understanding the ways existing organisations function (May & Perry 2010). I acted as a collaborator during the 5YEP's development process by gaining a nuanced comprehension of the GMCA Environment Team's processes and ways of thinking and used my capacity to mobilise that knowledge for new collaborative opportunities with diverse audiences to support the co-productive approach's aspirations.

I used my capacity and role within the embedded research position to support the collaborator function. I used my position with the GMCA Environment Team and the trust I gained from policy professionals and active stakeholders to expand collaboration through the co-productive pathways with stakeholders that possessed diverse knowledge. The 5YEP's development process was highly dynamic and required strong commitment from the GMCA Environment Team and the active stakeholders to facilitate on an ongoing basis (Participant 14, personal communication; Participant 17, personal communication). The participation and engagement fostered through the co-productive pathways were challenging for some active stakeholders to consistently contribute toward because the GMCA Environment Team were often opaque with how they would utilise knowledge contributions in policy decision-making (Participative Observation Field Note, 20 February 2018; Participant 18, personal communication). I used my role as a collaborator to broker these challenges, using my capacity within the GMCA Environment Team to create opportunities for the co-productive pathways to informal internal decision-making. This ensured the contributions from the co-productive pathways were integrated into the GMCA Environment Team's internal activities and demonstrated to active

stakeholders and interested citizens that there was a relatively trusted individual committed to collaborative engagement.

One instance that illustrates my collaborator role as an active intermediary emerged during the lead up to the 2018 Green Summit. During this period, a contingent within the GSSG openly contemplated withdrawing their support from the co-productive pathway (Participant 6, personal communication; Participant 7, personal communication). This group considered leaving the GSSG because they were concerned that the GMCA Environment Team proclaimed to want public participation to be a cornerstone of the 5YEP's development process within the framework of the co-productive approach but did not have a deep commitment to this principle (Participant 9, personal communication). This concerned group grew wary that the GMCA Environment Team was misleadingly using the language of inclusivity and civic engagement as a cudgel to coerce capacity and resources from GSSG members (Participant 1, personal communication; Participant 9, personal communication). They feared the GMCA Environment Team did not prioritise and lacked a commitment to utilise different sources of knowledge and expertise as they developed the 5YEP's content (Participant 3, personal communication). One GSSG member described this collaborative challenge,

> "There was a point when I became quite worried and concerned about being involved (in the GSSG). I believe very strongly in the original intention to be ambitious and create a plan based on genuine community participation…I was happy to contribute my time and some resources from our organisation but only because I thought this was a process that was going to be exciting and inclusive. Once those things went away, I felt exploited."
>
> ——Participant 1, personal communication

This sentiment highlighted the risk that the GSSG and co-productive approach for developing the 5YEP could dissolve. An informal solidarity group of active stakeholders within the GSSG began forming in the fall of 2017 and focused their effort on ensuring public participation was a meaningful tenant of the policy development process (Participative Observation Field Note, 23 November 2017). This solidarity group was founded upon a trusted set of relationships between the members and over time, I unofficially joined this group (Participative Observation Field Note, 23 November 2017; Participant 7, personal communication). The solidarity group attempted to mobilise its collective intelligence and relationships to identify opportunities for

solidifying the 5YEP's commitment to public participation and provide resources to enable public engagement activities to take place (Participative Observation Field Note, 10 January 2018).

As I evaluated earlier, the GMCA Environment Team openly considered expanding the scope of the listening event co-productive pathways to include a more diverse group of perspectives following the recommendations of the GSSG (Participative Observation Field Note, 17 October 2017). The solidarity group used this opportunity to offer their networks to enable interested citizens with different perspectives to engage in the policy development process (Participative Observation Field Note, 17 October 2017). In my collaborator role, I used the active intermediary function to provide my skills and expertise to facilitate listening events with interested stakeholder groups (Participative Observation Field Note, 3 November 2017). Additionally, I mobilised my capacity and resources through the embedded research position to ensure the data gathered at these events would be utilised by the GMCA Environment Team for policy decision-making (Participative Observation Field Note, 5 February 2018). My role as a collaborator helped demonstrate the GMCA Environment Team's commitment to the co-productive approach as the embedded research position ensured there was some capacity to facilitate collaboration. A member of the GSSG and a self-identified member of the solitary group noted this impact,

> "…you became a part of that group but you were much more involved on a day to day basis. Your role making so many of the listening events happen was crucial…You were also influencing the GMCA (Environment Team) in a positive direction behind the scenes which reinforced the efforts made by me and others in that group…in that example you connected some of the threads that were disjointed to make the process more aligned with the co-productive intention."
>
> —Participant 7, personal communication

Figure 13. Effects of the Collaborator Role			
Order Effect	Category of Effect		
1st Order Effect	<u>Product</u> • Organised participative activities at 2018 Green Summit purposed by GSSG • Organised listening events using contacts gathered by GSSG members	<u>Capacity</u> • Coordinated listening events • Engaged and reported embodied knowledge bases • Reflected non-traditional voices in internal GMCA Environment Team meetings	<u>Network</u> • Strengthened networks harnessed through GSSG • Supported knowledge flows between active stakeholders in GSSG with GMCA Environment Team
2nd Order Effect	<u>Policy</u> • Greater Manchester Springboard Report proposed policy actions raised at listening events		

Through the collaborator role as an active intermediary, I used my capacity in the embedded research position to facilitate commitment to the co-productive pathways and public engagement during the 5YEP's development process. This led to some achieved short-term product, capacity and network first order effects (see Figure 13). As an active intermediary, I used my position to map the GMCA Environment Team's organisational processes and mobilised my capacity to deploy intelligence and take advantage of insights. Furthermore, my role as a collaborator led to some second order policy effects reflected in the Springboard Report. I helped realise these second order policy effects by using my capacity and resources within the GMCA Environment Team through the embedded research position to ensure a commitment to utilise the evidence and new perspectives contributed through the co-productive pathways in policy decision-making.

8.1.3 The engager

The ‘engager’ role I had as an active intermediary was the third way I supported and facilitated co-production during the 5-Year Environment Plan’s development process. The engager role supported a form of inclusive knowledge brokerage where an active stakeholder deliberately identifies uninvolved stakeholders with relevant expertise and knowledge and supports mechanisms to engage those individuals (Michaels 2009). Active intermediaries can act as nodes, connecting disparate individuals and groups to collaboratively work towards collective goals (May & Perry 2010). One of my responsibilities within the embedded research position was to support the engagement of stakeholders that had traditionally been excluded from climate policy development processes (2017 Memorandum of Understanding, Greater Manchester Low Carbon Hub). The engager role describes this responsibility in which I supported the strategic evaluation of key stakeholder groups in Greater Manchester's climate governance landscape, identified conventionally excluded perspectives and engaged previously overlooked stakeholders during the 5YEP’s development process, expanding the scope of policy contestation and debates.

Figure 14. Effects of the Engager Role

Order Effect	Category of Effect	
	Product	Network
1st Order Effect	• Developed listening event pack • Analysed listening event data into report • Facilitated expert workstreams • Organised participative activity at 2019 Green Summit	• Supported building new networks with public stakeholders through listening events • Identified stakeholder groups to engage in expert workstreams

The first influence I had within the engager role as an active intermediary was expanding the perspectives engaged during policy deliberations and supporting co-productive pathways that targeted conventionally excluded stakeholders, enabling new perspectives to participate in policy negotiations. I began supporting the engager role from my entry into the field in October 2017. From the outset of the 5YEP’s development process, the GMCA Environment Team expressed a desire for the co-productive approach to enable “unusual” stakeholders to

participate in policy development (Participative Observation Field Note, 3 November 2017). Although the GMCA Team wanted the 5YEP's development process to be more inclusive of unusual stakeholders relative to previous policy development processes, they did not articulate what types of new stakeholders they wanted to engage, how more diverse participation would be facilitated, and how those newly engaged perspectives might support policy deliberations (Participative Observation Field Note, 3 November 2017). Given the GMCA Environment Team's ambiguous commitment to broad civic engaged, I utilised the embedded research position and active intermediary role to support engaging interested citizens through the co-productive pathways to bring new perspectives into policy debates and expand policy deliberations.

The clearest example of the active intermediary's engaging role is encapsulated within my actions designing, organising and facilitating the listening event co-productive pathway. As I have evaluated throughout the thesis's empirical chapters, the GMCA Environment Team intended to use this pathway to capture specialist knowledge from technical practitioners through six listening events (Participative Observation Field Note, 17 October 2017). The GMCA Environment Team's initial narrow aim for this co-productive pathway was extractive in that public participation was conceived as a mechanism for accumulating knowledge and capacity resources. After the GSSG successfully persuaded the GMCA Environment Team to expand the listening event co-productive pathway to engage a broader range of stakeholders, the GMCA Environment Team lacked the network internally to engage new audiences, did not map the stakeholders they would be engaged and did not conceptualise how wider participation would influence contestation within the policy development process (the Observation Field Note, 20 November 2017).

The GMCA Environment Team was reticent to allocate their internal organisational capacity and resources to support the co-productive pathways, particularly those pathways that focused on involving interested citizens (see Chapter 7.1). The GMCA Environment Team delegated me to lead the listening event co-productive pathway, relieving the organisation from dedicating significant internal capacity to facilitate this co-productive pathway. I deliberately used my position to increase the scope and diversity of interested citizens that could participate in listening events, expanding the perspectives engaged in policy debates.

The GMCA Environment Team rhetorically supported this ambition but did not provide any material resources to support this aim (Participative Observation Field Note, 21 December 2017). The GMCA Environment Team asserted their organisational resources and capacity were only sufficient to engage stakeholders that they perceived as key constituents (Participative Observation Field Note, 21 December 2017). The decision to not allocate organisational resources for engaging interested citizens demonstrates that the GMCA Environment Team considered technical practitioners their primary constituency, despite the co-productive approach's intention to facilitate broader public participation in the 5YEP's development process. The GMCA Director of Environment described my role expanding the perspectives involved in policy deliberations through the listening events while recognising the limited support provided by the organisation,

> "I was happy for you to try to involve unusual suspects, but I really wasn't sure who would show up. The majority of people that attended were individuals I had no previous relationship with…They came from all different backgrounds and raised new issues and priorities that I was not expecting…You had skills and experience to carry this out. We were not able to do what you achieved. Even if we had had those relationship, we would not have been able to manage that process and analyse what came of it."
> — GMCA Director of Environment, personal communication

My impact identifying and supporting opportunities for diversifying public participation led to short-term first order product, capacity and network effects. As an active intermediary, I mapped existing networks and identified opportunities to expand engagement through conducting a stakeholder analysis of Greater Manchester. This work led me to organise 26 of the 42 listening events, most of which engaged interested stakeholders previously unknown to the GMCA Environment Team (Participative Observation Field Note, 15 December 2017; Participative Observation Field Note, 9 March 2018). My role as an engager also supported second order policy effects by expanding the perspectives and knowledges that participated in the policy development process (Participant 10, personal communication). My role as an active intermediary supporting engagement supported the co-productive policy development process by diversifying public participation and developing pathways for that participation to influence policy contestations.

My impact through the engager role as an active intermediary led to some product and network first order effects. I helped build and mobilise new networks and developed knowledge arenas for interested stakeholders with different knowledge to exchange and deliberate their ideas. My impact within the engager function only tangibly facilitated first order effects. There were no second order policy or organisation effects that resulted from this function. Through my role as an engager, I supported more diverse tacit knowledges gaining access into the policy development process, which led to more robust policy deliberations and a more inclusive set of interested citizens engaging in policy debates compared to traditional GMCA climate policy development processes.

As I have reflected through the use of the Williams 2017 integrated evaluation framework, I made a variety of impacts throughout the 5YEP's development process. The effects and influences I made can be delineated and understood across the three primary roles I fulfilled as an active intermediary. Reflecting on my impact demonstrates that I was able to influence the co-productive policy development process primarily through short-term first effects and some second level effects. However, my impact through all three roles did not result in long-term third level effects. Having reflected and explored the impact I made upon the 5YEP's co-productive development process, I will now examine how and why I had these particular influences on the process and what my particular position might illustrate for the co-productive policy development process.

8.2 Reflexive analysis — Exploring the roots that underpinned my effect

In section 8.1, I utilised the Williams 2017 integrated evaluation framework to reflect the effects I made during the co-productive policy development process. As I analysed, some of the effects I made through my role as an active intermediary were supported by the design of the embedded research position, while other effects were motivated by my positionality. Having explored the different roles I fulfilled within the embedded research position, I will now evaluate how and why I was able to pursue these distinctive roles and reflect on what this has meant to the co-productive policy development process. I do this by analysing the reflexive section of my field notes collected during the embedded research position (see Chapter 4.51.). Through analysing the reflexive section of the field notes, this section explores how I was particularly able to produce thoughts and actions within the embedded research position to

build capacity for the co-productive approach, foster collaboration in a contentious policymaking environment and engage diverse stakeholders' perspectives. Furthermore, the section examines the limitations I encountered. The section contributes to the thesis by evaluating some opportunities and challenges of co-production in institutional policy development contexts.

My capacity building role as an active intermediary was primarily fostered by the embedded research position's design. However, evaluating the reflexive section of the participative observation field notes demonstrates my positionality also bolstered this role. The identity and standpoint dimensions of my positionality supported my ability to navigate the complexities of the 5YEP's development process and enabled me to use the power I gained through my proximity to the GMCA Environment Team to acquire additional support for the co-production approach and pathways from other stakeholders. For example, when I was given the task to co-deliver the listening event co-productive pathway with the external consultant, I chose to amplify the capacity I contributed through the embedded research position by using my position within the GMCA Environment Team to solicit organisations to host listing events, using my capacity and identify as a capability to evoke change in the policy development process (Participative Observation Field Note, 21 December 2017). I was able to use my capacity within the embedded research to exceed the GMCA Environment Team's public participation exceptions for the listening events by persuading external organisations such as the 10 Local Authorities, Chorlton Park Primary School, and the North West Business Leadership Team, amongst other to dedicate their own resources to coordinate listening events (Participant 5, personal communication; Participative Observation Field Note, 3 March 2018). My identity, standpoint and proximity to the GMCA Environment Team enabled me to support the 5YEP's co-productive approach through the capacity building function.

I was also able to galvanise a co-productive culture within the GMCA Environment Team through my capacity building role through my positionality's identity, history, and language dimensions. I shared several identity and history characteristics within the GMCA Environment Team policy officers that supported my ability to nurture a co-productive culture by gaining their trust and respect, enabling my ability to encourage organisational change (Participant 5, personal communication; Participant 19, personal communication). These overlapping dimensions of our history allowed me to assimilate and build affinity with the GMCA Environment Team policy officers, strengthened my capacity building role to a build

co-productive culture within the GMCA Environment Team (Participative Observation Field Note, 28 September 2018; Participant 19, personal communication). How the policy officers viewed me — and appreciated these shared identity and history qualities — enabled the policy officers to quickly build a sense of affinity with me, increasing the efficacy of my capacity building role (May & Perry 2010).

The language facet of my identity also aided my ability to embed a co-productive culture within the GMCA Environment Team and influence the co-productive policy development process. The language I used in the embedded research position was inseparably situated within the social context in which I exist and informed how I was perceived by others (Garfinkel 1967; May & Perry 2017). This subconsciously demonstrated to the policy officers that I was a subject matter technical expert like them and that my actions within the embedded research position were founded on an evidentiary base similar to their own. My common use of language and the social context in which I spoke further enabled me to build interpersonal connections with the policy officers and gain their trust (Participative Observation Field Note, 28 September 2018). The language dimensions of my identity and how my use of language was internalised by policy officers further assisted my capacity building function to galvanise a co-productive culture within the GMCA Environment Team.

The effect I made upon the co-productive policy development process through the active intermediary's collaborator role was predominantly facilitated from my standpoint, rather than emanating from the embedded research position itself. As evaluated throughout the empirical chapters, numerous tensions emerged between active stakeholders and the GMCA Environment Team during the 5YEP's development process, some of which corroded active stakeholders' eagerness and threatened to negate the co-productive pathways (see Chapter 8.1.2). Through the embedded research position and active intermediary role, I influenced the co-productive approach by reconciling some of these obstacles and strengthening collaboration as the momentum around the co-productive pathways risked dissolving (see Chapter 8.1.2). My impact negotiating some of the conflicts that arose and maintaining the co-productive pathways was enabled by my committed standpoint to climate action. This factor — my standpoint— allowed me to realise the collaborator role during the 5YEP's development process.

I approached this research with deeply held social values and ethics that informed my standpoint as I negotiated the embedded research position's boundaries and influenced my actions within it. This ethical dimension of my standpoint compelled me to engage in activities as an active intermediary that would promote robust climate action, even if those activities were uncomfortable and not required of me. The embedded research position was not designed to place me as a mediator between frictions that emerged during the co-productive policy development process, but it was highly likely that I would be placed within contentious scenarios as an individual involved in facilitating several of the co-productive pathways that supported policy contestation. Although I was not obligated to engage with or resolve conflicts as they emerged, my standpoint compelled me to help negotiate some of these debates. This aspect of my standpoint that led to the collaborator role was recognised by others involved in the 5YEP's development process,

> "You weren't afraid to raise your voice and step into the middle of an argument when you thought a dispute during the process was harmful and could be resolved…I think most people recognised you were doing that because you genuinely wanted to see progress being made…It was apparent it wasn't part of your role to step in the middle of conflicts or bring people together, but you did this well because you were coming at it from a genuine place."
>
> — Participant 16, personal communication

My standpoint prompted the collaborator role and allowed me to create this influence during the 5YEP's development process through the embedded research position. As I analysed in Chapter 8.1.2, the collaborator function was most clearly exemplified during the GSSG co-productive pathway when I demonstrated and reassured some active stakeholders that there was continuity and commitment for public participation to support the development of inclusive climate action in the 5YEP. The GMCA Environment Team's technocratic organisational culture made it difficult for some GSSG members to have confidence that the perspectives of interested citizens engaged through the co-productive pathways would be substantively considered in policy decision-making, causing some active stakeholders to consider exiting the process (see Chapter 8.1.2). I influenced the co-productive policy development process in the collaborator role through my actions within the embedded research position and penchant for involving myself in these quarrels as a mediator.

I was able to influence the 5YEP's co-productive development process through the engager function designing and facilitating opportunities for diverse perspectives to participate in policy debates from how the embedded research position was negotiated and specific relationships I was able to develop through my academic supervisor. The GMCA Environment Team wanted the embedded research position to support more expansive public engagement in policy development processes beyond the 'usual suspects' they conventionally engaged (Participative Observation Field Note, 12 October 2017). As I evaluated earlier, the GMCA Environment Team wanted to engage a broader range of perspectives during the 5YEP's development processes and wanted me, within the embedded research position, to support developing novel public participation pathways (Participative Observation Field Note, 12 October 2017). As such, the embedded research position itself was negotiated at the outset of this research to support and facilitate the engager role (2017 Memorandum of Understanding, Greater Manchester Low Carbon Hub; 2018 Memorandum of Understanding, Greater Manchester Low Carbon Hub).

While the embedded research position was negotiated to support the engager role, I fulfilled during the 5YEP's development process, I encountered challenges that made achieving this effect difficult. As I evaluated earlier, I analysed the primary climate and environmental stakeholder groups throughout Greater Manchester while creating the participation pathways so that they could engage diverse stakeholders, particularly those that had been conventionally underrepresented in policy decision-making (see Chapter 5.2). Once I began this activity, the GMCA Environment Team quickly reticent to enable widespread public participation in the 5-Year Environment Plan's development process due to their limited capacity and concern that tacit knowledge contributions from interested citizens would conflict with the priorities that emerged from the technical practitioners with specialist knowledge (Participative Observation Field Note, 14 December 2017). As the GMCA Environment Team decreased their rhetorical support for broadening civic participation, my academic supervisor helped me foster new relationships that enabled me to make an influence through the engager role.

One example of my influence through the engager role as an active intermediary identifying and facilitating opportunities that diversified the perspectives engaged in policy debates came to fruition through relationships, I developed with interested citizens that were facilitated through my academic supervisor. The stakeholder analysis I conducted in the fall of 2017 provided me with a broad understanding of the stakeholder groups the GMCA Environment

Team conventionally engaged in policy development processes and the types of stakeholders that traditionally excluded. My academic supervisor helped connect me with interested citizens representative of stakeholder groups I had identified through the stakeholder analysis (Participative Observation Field Note, 19 January 2018). Most notably, these introductions led me to form relationships with activists and campaigners that led to the creation of the Greater Manchester Climate Action Network (GM-CAN) (Participative Observation Field Note, 19 January 2018; Participative Observation Field Note, 19 June 2018). These relationships my academic supervision helped me develop enabled me to influence the co-productive approach used to develop the 5YEP through the engager role.

As I have explored above by reflecting and analysing the reflexive sections of my participative observation field notes, numerous factors enabled me to effect and influence the co-productive approach used to develop the 5YEP through the capacity building, collaborator and engager roles of the active intermediary position. Some of the impacts I made resulted from how the embedded research position was negotiated, as is the case with the capacity building role. Meanwhile, particular aspects within my positionality enabled me to facilitate other impacts as demonstrated through the collaborator and engager roles. Through reflexive examination, it appears that my influence on the co-productive approach through these different roles I assumed affected that co-productive policy development in particular ways, guided by my unique positionality. Co-production is messy, complicated, and dynamic. The reflexive analysis highlights that the embedded research position's specific negotiation and design, coupled with my positionality, influenced this policy development process. Having examined the influence I had upon the co-productive policy development process and how I made those effects in the first two sections of this chapter, I will now analyse how the GMCA Environment Team's organisational practices supported and limited the co-productive approach and explore the opportunities and challenges that emerged from investigating co-productive policy development as an embedded researcher.

8.3 Embeddedness: Inside out, outside in

I began Chapter 8 by reflecting on my role as an active intermediary within the embedded research position and analysed the different effects I made that have influenced the 5YEP's co-productive development process. Next, I explored how my positionality and the terms negotiated for the embedded research position contributed to the capacity building,

collaborator and engager roles I had during the 5YEP's development process. I determined the short-term first and second level effects I made upon the co-productive policy development process through this analysis. These first two sections of the chapter have illuminated the particular impact I made upon the co-productive policy development process that this thesis considers through the methodological approach of embeddedness. These sections of the chapter highlight the distinctive position I had during this policy development process that enable me to analyse that process from a unique vantage point, 'behind the curtain' within the GMCA Environment Team. In this final section, I use that vantage point to explore the GMCA Environment Team's organisational ability to support the co-productive climate policy development approach and evaluate the challenges they faced while attempting to adopt that approach in a contentious political area.

The GMCA Environment Team was rigid in how they attempted to adopt the co-productive approach (Participative Observation Field Note, 4 November 2017). Co-production was a novel policy development approach for the GMCA Environment Team that they attempted to support without altering or reforming their standard ways of working (Participant 9, personal communication). This created an obstruction for the co-production approach that the GMCA Environment Team policy officers did not identify or recognise. Using my position behind the curtain within the GMCA Environment Team, I was able to develop an understanding of the organisation's operational dynamic as an insider while analysing that dynamic from a critical distance, with the curiosity of an outsider. Some active stakeholders recognised this analysis I was able to form through my location in a boundary space through the embedded research position as one GSSG member noted,

> "You asked questions that no one there (within the GMCA Environment Team) would even think to ask. You also had the courage to ask the questions that those of us involved in these processes for years were too polite to ask but needed to be said. By being amidst the GMCA (Environment Team) you also were able to ask those questions in a way that would resonate because you could understand the particular mindset of the policy officers."
>
> — Participant 3, personal communication

The boundary space I occupied through the embedded research position also enabled me to support and analyse the co-productive approach used to develop the 5YEP by providing me

with the particular ability to communicate contested policy issues with the GMCA Environment Team from a non-threatening perspective. The GMCA Environment Team frequently confronted contentiousness throughout the 5-YEP's development process (see Chapter 7.2). Members of the GSSG persistently advocated for sensitive issues to be vigorously acted upon, political and executive leadership constrained the process to be led from a position of technocratic pragmatism, the technical practitioners that participated in the expert workstreams advocated for an array of policy issues in their particular area of expertise, and activists and campaigners pushed the policy development process to take action which would 'do more, faster'. The GMCA Environment Team operated within a cautious organisational culture and was not comfortable directly engaging in many of these contentious policy debates, as illustrative of the example of obstructing action on sensitive issues (Participant 12, personal communication; Participative Observation Field Note, 20 February 2019).

The contested policy development landscape and cautious organisational culture of the GMCA led the GMCA Environment Team to struggle meaningfully engage with contentious policy debates during this process. Using my position within the boundary space, I was able to identify the GMCA Environment Team's reticence to grapple with some of these contentious policy debates because of the organisational culture they operated within (Participative Observation Field Note, 20 June 2018). With this understanding, I used the embedded research position to address some of these policy discourses that arose through the co-productive pathways with the GMCA Environment Team in off the record, private settings (Participative Observation Field Note, 7 March 2019; Participant 19, personal communication). Through the boundary space, I was able to broach policy debates that the GMCA Environment Team that the organisational culture did not encourage them to engage and I was able to do so in forums that were perceived by the policy officers as less threatening than the co-productive pathways. The GMCA Director of Environment recognised my ability to communicate contested policy issues using the analysis I developed through the boundary space,

> "You were able to challenge us in the Environment Team in a way that landed much more sharply than what we perceived as criticism from others…You also benefited as someone with an independent voice but had the ability to raise challenges in private settings where officers were able to debate the ideas in a risk free environment."
> — GMCA Director of Environment, personal communication

The boundary space I inhabited during the co-productive policy development process granted me the ability to navigate contested policy issues with the GMCA Environment Team from a unique position. This boundary space position also allowed me to develop 'alternative spaces for knowing' (Pollack & Eldridge 2015). In essence, the boundary space enabled me to translate contested policy issues raised through the co-productive pathways that were frequently perceived by the GMCA Environment Team policy officers as risky arenas into safer deliberative spaces (Participant 14, personal communication; Participant 19, personal communication). The GMCA Environment Team regularly deflected from deeply engaging with the challenging policy ideas raised by active stakeholders and interested citizens through the co-productive pathways (Participant 10, personal communication). Using the analysis I formed within the boundary space, I could translate some of the contested policy debates that emerged through the co-productive pathways into alternative spaces where the GMCA Environment Team could consider them without being constrained by the external pressures that seemingly limited their willingness to engage (Participative Observation Field Note, 7 February 2019).

While I successfully communicated contested policy issues through my particular location in the boundary space, this was not a phenomenon that necessarily enhanced the co-productive approach. The GMCA Environment Team intended to utilise a co-productive approach to develop 5YEP with the aspiration of determining policy outcomes that were novel from prior Greater Manchester climate policies (see Chapter 7.1). As I evaluated in Chapter 6.3, the co-productive approach ultimately did not lead the 5YEP to produce unconventional policy outcomes. Therefore, it could be argued that my actions within the boundary space translating contentious policy issues ameliorated the transformative potential of the co-productive pathways I designed, facilitated, and analysed. It is possible these activities within the boundary space diminished the GMCA Environment Team's willingness to engage in the contentious policy debates that were supported through the co-productive pathways because they were simultaneously challenged in safer environments, giving them the allusion that they had substantively internalised and responded to policy critiques. While the analysis does not show my actions within the boundary space to have decreased the potential learning and transformation of the co-productive pathways, there is a possibility these actions had an ameliorating effect.

This capability to analyse and communicate controversial policy issues was enabled through the boundary space, not an intentionally designed or negotiated outcome of the embedded research position. As I evaluated earlier, the embedded research position was not intended to mediate tensions that emerged through the co-productive approach. However, as I analysed the co-productive approach as the policy development process transpired using thick descriptions within my field notes, I identified the GMCA Environment Team's organisational culture as an impediment that could limit the potential aspiration of the co-productive approach. Through my role as an active intermediary located in the boundary space, I was compelled to assume the role of translating knowledge that was contested through the co-productive pathways (Participative Observation Field Note, 2 March 2018; Participative Observation Field Note, 31 October 2018). Sitting at the intersection of contested policy debates and being informally positioned as a knowledge broker was an emotionally demanding task but became an important role within the embedded research position because of where I was situated in relation to other stakeholders involved in the 5YEP's development process.

As I have analysed, embeddedness positioned me to share some qualities as insider with the GMCA Environment Team. Simultaneously, my outsider characteristics provided me with distance to analyse GMCA's organisational culture and the policy development process I was actively involved in. The boundary space I straddled as a quasi-insider/outsider enabled me to evaluate the 5YEP's development process from a unique perspective while that process was taking place and supported my ability to intervene in that process to take actions that supported the co-productive pathways. I also mobilised my position within the boundary space to communicate contested policy issues from a particular perspective, undertaking actions to translate knowledge. While I took action to support the co-productive approach, it is possible these actions were received by the GMCA Environment Team in a manner that ameliorated the transformative potential of co-production, although there is no direct evidence to suggest this. Overall, this section demonstrates that co-productive policy development — particularly in contentious arenas such as climate change — may require forms of mediation and knowledge brokerage, features that embedded researchers may be well suited to perform through their boundary space positioning.

Throughout this chapter, I have reflected and evaluated the effects I made on the co-productive policy development process. As analysed throughout the chapter, embeddedness not only enabled me to support the co-productive policy development process this research investigated,

but it also enhanced my ability to analyse it and form understandings about it. Having evaluated the empirical research through the previous four chapters, I will now explore a set of conclusions from this research and demonstrate what this thesis's findings signify for relevant future theoretical and practical discourses.

9. Conclusions

This concluding chapter aims to synthesise together the research findings, explain how these findings represent a contribution to knowledge, and consider what these findings reveal about the potential of co-productive urban climate policy development to facilitate a more inclusive, sustainable future.

Local government organisations have increased their attention on climate change as a consequential and urgent policy challenge requiring specific attention and novel approaches to address meaningfully. The thesis's central aim was to investigate how co-productive urban climate policy development, one such new approach, was understood and applied within one local government organisation, its potential to produce meaningful urban climate policy actions and its implications for the individuals and organisations involved in the co-productive policy development process. This thesis used an embedded approach to investigate and analyse this aim, a distinctive yet apt methodological approach for exploring urban climate change decision-making in a politicised and contentious environment. Through this research approach, the thesis has developed a rich understanding of precisely how co-productive urban climate policy development took place within one institutional context.

This thesis's research aim was explored by initially examining urban climate governance and co-production theory through a conceptual framework that demonstrated the weaknesses of conventional methodologies and how they may be surmounted if local government organisations were to adopt co-productive climate policy development approaches. In doing so, this section of the thesis fulfilled the first research objective. The empirical study then explored this conceptual model of co-productive urban climate policy development and gained an understanding of the opportunities, challenges, and limitations of the approach as applied in one local government policy development setting. This empirical section of the thesis provided analysis that responded to the second and third research objectives. The conclusions in this chapter synthesise the key findings analysed in previous chapters by explicitly reflecting on the research questions this thesis sought to evaluate:

- How is co-productive urban climate policy development understood and applied by different types of stakeholders involved in a co-productive policy development process?

- How might a co-productive approach support urban climate policy development, and what are the limits?
- What are the consequences of co-production as an urban climate policy development approach for local government organisations and involved stakeholders in addressing the challenges and opportunities of climate action?

In answering these questions, this concluding chapter brings out and demonstrates the significance of this research's findings for progressing scholarly debates surrounding innovative urban climate policy development approaches and their potential capacity to support policy decision-making through robust forms of contestation between stakeholders with diverse perspectives. For practice, this research has developed new understandings about the challenges and opportunities of utilising co-productive approaches in policy development processes. The first section of this chapter explores how the data analysed throughout the thesis's empirical analysis chapters respond to and answers each research question and why these understandings provide a meaningful contribution to wider discussions. The second section of this chapter examines what new areas of inquiry result from this thesis's findings. Furthermore, this final section of the chapter reflects on the thesis's impact and consequence.

9.1 Findings from Greater Manchester and the 5-Year Environment Plan

This research sought to answer three questions that were posed at the outset of the thesis. Throughout the thesis, I have explored these questions. In the following section of the chapter, I reflect on each of these questions by evaluating the research data analysed in the empirical chapters of the thesis and examine why the knowledge produced through answering these questions is significant for wider theoretical and practical debates. To answer each research question, I consider the theoretical analysis through the conceptual framework against the empirical study's findings. These understandings provide answers to the research questions and generate knowledge that I explore below. In clearly addressing this thesis's research questions, the section synthesises and clarifies the learning that I have produced through this research.

9.1.1 The unattainability of co-production 'gold standards'

The initial research question I intended to explore throughout the thesis was *how is co-productive urban climate policy development understood and applied by different stakeholder*

groups involved in a policy development process? Earlier in the thesis, when analysing the conceptual framework, I evaluated that co-productive policy development had not widely adopted or empirically investigated despite interest in the approach (see Chapter 3.1). Therefore, this research set out to investigate how co-production was comprehended and adopted in an empirical policy development setting. I evaluated the particular dimensions of what co-productive policy development might support based on the theoretical claims that have been made of co-production (see Figure 3). In the empirical section of the thesis, I investigated how some of these hypothetical articulations manifested through specific forms of the co-productive urban climate policy development process while others struggled to gain traction. Throughout its analysis, this research has shown that — at least in this study of Greater Manchester — the 'gold standard' conceptualisation of co-productive policy development is an unrealistic and elusive expectation but instead signifies an aspiration where some of co-production's theoretical dimensions may emerge.

The conceptual framework synthesised six characteristics of co-productive policy development — citizen and public involvement, valuing different forms of knowledge, the potential for 'creative synergies', iterative experimentation and learning, transparent communication and enhanced accountability, and horizontal, cooperative leadership structures. These aspects of co-productive policy development were hypothesised based on the claims that have been made of co-production. The conceptual framework then proposed a theoretical model hypothesising how and why co-productive approaches might determine novel policy actions that differ from those achieved through urban climate traditional policy development processes (see Figure 4). This theoretical model's imagined impacts were based on understands of co-production but were unexplored in empirical policy development settings. By evaluating the co-productive process used to develop the 5YEP, this research has contributed to theory and practice by evaluating co-production in an empirical policy setting.

In the empirical section of this research, I evaluated that the GMCA Environment Team primarily adopted co-production as an approach for developing the 5YEP with the intention it would enable external organisations to contribute resources and capacity (see Chapter 7.1). Additionally, the GMCA Environment Team hoped the co-productive approach would help determine novel climate policy outcomes that were more ambitious than previous climate policies they produced (see Chapter 7.1). These motivations for utilising co-productive urban climate policy development differed from the characteristics and imagined outcomes of the

approach that were synthesised through the conceptual framework. This suggests the GMCA Environment Team understood co-production distinctly from how it is assessed in theoretical discourses. Despite this difference, the empirical research found that the GMCA Environment Team applied co-productive climate policy development in a way that approached reaching some of co-production's claimed potential. For example, I analysed that the co-productive pathways - the Green Summit Steering Group (GSSG), listening event, and Green Summit - used during the 5YEP's development process did support deeper citizen involvement (see Chapter 5.3). Furthermore, the GSSG and expert workstream co-productive pathways enabled creative synergies that supported novel policy measures articulated through some of the Springboard Report's proposed policy actions (see Chapter 6.3). Although the co-productive pathways did not realise the co-equal empowerment of citizens and the public, iterative experimentation and learning or produce horizontal cooperative leadership structures, this empirical research found some of the theorised dimensions of co-productive policy development did begin to emerge some capacity.

This research further demonstrated that the active stakeholders and interested citizens involved in the 5YEP's co-productive development process achieved some of co-production's theorised qualities, although to a lesser degree than suggested in theory. In the conceptual framework, I analysed that co-production has been suggested to be a concept with the potential to support power-sharing arrangements between policymakers and stakeholder groups (Chapter 3.2). It has been claimed that this power-sharing potential is facilitated through consistent, long-term engagement between citizens and stakeholder groups (Chapter 3.2). The theoretical model suggests that this form of power-sharing might enable co-productive urban climate policy development to determine novel policy outcomes through supporting robust policy contestation and negotiation, unlike rigid forms of policy decision-making consistent with conventional approaches. While the co-productive approach did facilitate more rigorous contestation and negotiation, as evidenced by the Springboard Report's outcomes, this did not lead to novel policy measures endorsed in the 5YEP.

The empirical analysis found some of the co-productive pathways that enabled interested citizens and active stakeholders to participate in the 5YEP's development to build trust with GMCA policy professionals through long-term relationships. However, these long-term relationships did not promote power-sharing or horizontal leadership structures that would have given citizens and stakeholders formal authority in policy decision making. Instead, these

relationships enabled interested citizens and active stakeholders to build trust with the GMCA Environment Team, producing policy learning rather than empowering these actors in decision-making. This can be evidenced by, for example, the GMCA Environment Team's decision to support cross-sectoral policy contestation in the expert workstreams that led to the Greater Manchester Retrofit Accelerator policy measure, as well as the decision to only present the SCATTER model to the GMCA Senior Leadership Team (SLT) following debates in the GSSG. Additionally, this can be revealed through the distinction between 'power over' the process exercised by the GMCA Environment Team versus the 'power to' moderately influence the process selectively wielded by active stakeholders that was explored in Chapter 7.3. The imagined impact of co-productive policy development that was anlaysed during Chapter 3.3, hypothesised power within this context would have been evenly distributed between active stakeholders – transcending the power over-power to dichotomy towards a more transformative 'power with' where stakeholders would have been empowered in an equitable manner.

This finding from the research demonstrates that although the 5YEP's development process did not realise the full theoretical claim that co-production may promote the empowerment of actors through horizontal leadership structures, the research did find some of these imagined impacts of co-production were achieved nonetheless. Although the theoretical ambition of co-productive urban climate policy development as set out in the conceptual framework was not fully realised in this empirical setting, some of the imagined characteristics did emerge, albeit to a lesser extent than conceptualised in theory.

The finding of the first research question is consequential for wider theoretical and practical debates. This research confirms that co-productive policy development approaches can reach policy outcomes by supporting deep citizen and stakeholder engagement and determining policy outcomes across diverse knowledges (Chapter 6.3). However, the research found these outcomes did not determine novel policy outcomes through new forms of power-sharing or empowerment as suggested of co-productive policy development. Instead, the GMCA Environment Team developed deep levels of trust with interested citizens and active stakeholders that informed their policy decision making but did not produce novel policy outcomes due to their power over the process (Chapter 6.3 ; Chapter 7.3). The GMCA Environment Team maintained their control and power over the decisions made during the 5YEP's development process. Despite that, the co-productive approach enabled public

participation to go beyond the traditional 'comment-box' model of conventional policy development to determine more inclusive policy outcomes. This finding reveals that the hypothetical impacts of co-productive urban climate policy development are unlikely to manifest in empirical settings, as claimed in theory. However, co-production's theoretical claims should be recognised as aspirational in empirical settings rather than regarded as fully attainable.

9.1.2 Co-production: Procedural innovations, yet traditional outcomes

The second research question I intended to examine in this thesis was, *how might a co-productive climate policy development process support public participation, and what are the limits?* In the theoretical framework, I analysed that co-production emerged, in part, from the intellectual roots of Arnstein 1969's *ladder of participation* (see Chapter 3.1). It has been widely claimed in the scholarship that co-production has the potential to move beyond the lower rungs of manipulation and placation in the participation ladder up to delegated power, partnership, or even ascending to citizen control (Bovaird & Loeffler 2012; Tippett & How 2020). Public participation is typically considered 'a good thing' in public policy literature, but co-productive participation is conceptualised distinctly from traditional notions of participation (Pestoff 2009). Conventional forms of public participation in urban climate policy development processes are thought to have the potential to support determining meaningful policy outcomes by facilitating robust contesting between the diverse perspectives that exist and carefully selecting the most appropriate policy measures, although this is rarely realised in practice (Chapter 3.1). Through its analysis, this research found that the co-productive approach used to develop the 5YEP did support new forms of enhanced public participation between policy professionals and the wider public, but those procedural innovations did not ultimately determine novel policy outcomes.

The empirical research found that, in part, the GMCA Environment Team intended to adopt a co-productive approach for developing the 5YEP because of its perceived potential to facilitate robust public participation (see Chapter 6.1). The empirical analysis determined that the co-productive pathways did support broader, more inclusive public participation during the 5YEP's development process beyond conventional forms of public engagement (Chapter 6.2). For example, the listening event co-productive pathway engaged some interested citizens who had not previously participated in any Greater Manchester climate policy development

processes and integrated their views into the Springboard report (Chapter 6.2). These new perspectives that gained entry into the 5YEP's development process created opportunities for debate and contesting novel policy issues such as public ownership of green infrastructure and environmental justice (Chapter 5.2; Chapter 6.3). While these specific policy areas were elevated through co-productive public participation, they were ultimately not codified in policy measures within the 5YEP. This research has determined that, in this particular instance, the co-productive policy development approach led to increased and new public participation mechanisms during the 5YEP's development process, a procedural innovation. However, these procedural innovations did not determine policy outcomes markedly distinct from a conventional process.

While the empirical analysis found co-productive urban policy development could support new forms of increased public participation during the 5YEP's development, this participation was limited to certain types of stakeholders and restricted the forms of knowledge evaluated in policy decision-making. Before developing the 5YEP, the GMCA Environment Team had established connections with a group of technical practitioners that they were comfortable engaging in policy development processes (Chapter 6.2). These expert practitioners held specialist knowledge that the GMCA Environment Team recognised as relevant and essential to integrated through the co-productive policy development process (Chapter 6.2). The GMCA Environment Team believed the co-productive policy development approach would also facilitate citizens' engagement in the 5YEP's development to make the process more democratic and representative of the public's priorities (Chapter 6.2). By analysing the five co-productive pathways used throughout the 5YEP's development, its evident that the co-productive approach was able to engage new stakeholders that had previously been excluded from climate policy development (see Chapter 7.3). However, these newly engaged stakeholders primarily contributed tacit knowledge to policy debates that the GMCA Environment Team assessed as less relevant than technical practitioners' specialist knowledge contribution (Chapter 7.3). The GMCA Environment Team assessed the different forms of contributed knowledge on a hierarchy where tacit knowledge was valued as less significant than specialist knowledge. This hierarchical appraisal of knowledges diminished the impact of the diverse public participation supported by the co-productive policy development process.

The effect of broader public participation through the 5YEP's co-productive development process was also limited by the GMCA Environment Team's perception of 'expertise'. As

evaluated, the co-productive pathways successfully engaged active stakeholders and interested citizens from diverse backgrounds and perspectives (Chapter 6.3). Although broad public participation was promoted as a strength of the 5YEP's development process, only those stakeholders who contributed specialist knowledge were perceived by the GMCA Environment Team to have had informed perspectives, satisfactory for robust evaluation. For example, the expert workstreams narrowly concentrated on acquiring knowledge contributions from technical practitioners viewed as having the professionalised skills and highly trained intelligence integral for policy development (Chapter 7.3). Meanwhile, interested citizens who lacked these formalised backgrounds were perceived as lacking the expertise required to support policy development (Chapter 7.3). Co-production's theorised ability to legitimise diverse forms of expertise and knowledge was not realised in this particular policy development process, which diminished the possibility for novel policy outcomes to be determined through the expanded public participation.

The finding that co-productive urban climate policy development could, at least in this specific case, produce procedural innovations by enhancing public participation yet ultimately determining conventional policy outcomes has significance for theoretical and practical debates. Some of the shortcomings within traditional processes have been critiqued as lacking the capability to bring together and foster deliberation across the full range of existing perspectives that could be incorporated to determine policy (Chapter 2.3). For instance, the conceptual framework assessed seven factors that influence urban climate policy development — economic paradigm, public pressure and civic advocacy, urban governance capacity, political will and leadership, local government organisational culture and norms, perceived climate vulnerability, accessible knowledge base (see Figure 3). Frequently, neoclassical economics — growth economics — is normatively assumed as the only economic paradigm that informs decision-making during most urban climate policy development processes. However, suppose heterodox economic perspectives were engaged and appraised through negotiation during these processes. In this hypothetical case, stakeholders could promote alternative economic frameworks that would be impartially assessed during policy decision-making, creating the potential for innovative policy outcomes.

While the co-productive approach used to develop the 5YEP created some novel opportunities for stakeholders with non-traditional perspectives to engage in the policy developed process, these perspectives were not assessed equally to those stakeholders that held specialist

knowledge (Chapter 7.3; Chapter 8.3). This finding is significant, demonstrating that co-productive urban climate policy development can support procedural innovation through enhanced public participation but not necessarily empowering or legitimising those distinct perspectives that would be needed to achieve novel policy outcomes.

9.1.3 Modest effects within the long-term journey

The final research question I intended to evaluate in this thesis was, *what are the consequences of co-production as an urban climate policy development approach for a local government organisation and the stakeholders they engage in the process?* The conceptual framework assessed urban climate policy development as primarily influenced by seven factors (see Figure 3). In recent years, there has been increased demand from society to accelerate urban climate policy action. Many have advocated for innovative urban governance approaches to realise these ambitions (Wolfram et al. 2019). In the conceptual framework, I analysed co-productive urban climate policy development as one innovative approach that has been theorised to have the capability to influence some of these seven factors (see Chapter 3.3). The GMCA Environment Team decided to adopt a co-productive approach for developing the 5YEP, explicitly with the intention that the approach would support accelerated climate policy action and non-traditional policy outcomes (Chapter 6.1). This research evaluated that although the 5YEP's co-productive development process did not determine innovative or transformational policy actions, it did support some more consequences district from traditional approaches.

The conceptual framework evaluated co-production as a complex concept to facilitate in empirical settings, requiring significant resources and capacity (see Chapter 6.2). Furthermore, the conceptual framework evaluated co-production as a non-linear, dynamic approach that may struggle to achieve desired ambitions identified at the outset of a given process (see Chapter 3.3). The conceptual framework assessed co-productive urban climate policy development as having the potential to determine novel policy outcomes if the approach's challenges could be navigated (Chapter 3.3). The GMCA Environment Team intended for the co-productive approach to enable the stakeholders engaged in the process to contribute capacity and resources to the process, a desired outcome of co-production not suggested in theory (Chapter 6.2). Despite resource sharing not being a theorised benefit of co-productive processes, the GMCA Environment Team was able to attract capacity and resources from external stakeholders

engaged in the co-productive pathways. For example, the GMCA Environment Team received capacity, network, and knowledge contributions from the GSSG co-productive pathway (Chapter 6.2). Furthermore, the GMCA Environment Team secured capacity, knowledge resources and capability development from the University of Sheffield through this embedded research position (Chapter 8.1).

The empirical analysis found that the resources and capacity contributed throughout the 5YEP's co-productive development process were primarily determined by a stakeholder's ability to contribute rather than a reflection of their commitment to the process. For instance, the stakeholders that constituted the GSSG represented a range of organisations in various professional capacities. I analysed some individuals who participated in the GSSG as a formal representative of their organisation within salaried positions. In contrast, others participated voluntarily in addition to their professional commitments (Chapter 6.2). Furthermore, these stakeholders had access to different organisational resources that could be contributed to the process (Chapter 7.3). The empirical analysis demonstrated that the GMCA Environment Team was able to secure resource and capacity contributions from the engaged stakeholders because those stakeholders had a strong belief in the 5YEP's aspiration, a desire to make the policy robust and determined making these contributions could elevate their particular concerns into the decision-making process (see Chapter 7.3).

Despite the co-productive approach securing resource and capacity contributions from the engaged stakeholders, the thesis's empirical analysis demonstrates that co-productive urban climate policy development led to conventional climate policy outcomes. As evaluated in the research, the GMCA Environment Team and GMCA SLT maintained their power and control over the policy development process despite co-production's claimed ability to facilitate co-equal power-sharing relationships between stakeholders involved in a process (see Chapter 7.3). As the GMCA predominately maintained decision-making power throughout the 5YEP's development process, GMCA ultimately determined the policy actions codified in the 5YEP. I analysed the GMCA Environment Team's organisational cultural norm of valuing specialist knowledge above tacit knowledge as a critical factor (Chapter 8.2). Although the co-productive process facilitated resource and capacity contributions from the stakeholders engaged in the process, the GMCA Environment Team determined the policy's decisions, leaving some stakeholders disappointed that their contributions did not support novel policy outcomes.

As the GMCA Environment Team facilitated the co-productive pathways during the policy development process, it was reasonable to predict that they would have maintained a traditional distribution of power over the process. However, if the co-productive pathways had been determined and managed through an intermediary or external actor, there may have been a potential for more meaningful or transcendent empowerment of the full range of active stakeholders. For example, the listening event co-productive pathway evaluated in Chapter 6.2 was largely manged externally from the GMCA Environment and thus produced opportunities for novel interests to engage in policy deliberations which enabled unconventional policy actions garnering recognition. It is possible that, had the full scope of co-productive aspects of the policy development process had been facilitated externally, the co-productive approach would have impacted the final policy outcomes in a substantively different manner. This is, of course, a hypothetical assertion so it would need to be tested and interrogated empirically through future research before garnering any validity.

This research finding that co-productive urban climate policy development may be able to facilitate resource and capacity sharing while not determining novel policy outcomes is significant for theory and practice. This finding suggests that the co-productive approach influenced some of the factors that impact urban climate policy development identified in the conceptual framework, such as the accessible knowledge base and urban governance capacity, while ultimately not significantly altering the policy outcomes. The analysis demonstrated that the factor of local government organisational culture and norms that influence urban climate policy development was not impacted by the co-productive approach. As a super wicked policy challenge, climate change solutions are difficult to determine and slow to develop. While the co-productive approach did support some procedural innovations and numerous engaged stakeholders were committed to the process to the degree that they contributed resources and capacity, these procedural impacts do not inevitably facilitate novel policy outcomes.

This thesis sought to evaluate three core research questions. The research has achieved insights into each of these questions by analysing the empirical data produced during the GMCA Environment Team's co-productive approach to developing the 5YEP. These findings determined through the embedded research approach provide a rare evaluation of an empirical co-productive urban climate policy development process, exploring some of the theorised claims that have been made about co-production. In evaluating these questions, this research has determined that co-production's theoretical claims should be viewed as aspirational in

empirical contexts, unlikely to manifest as directly supposed in scholarship, and instead be perceived as an ambition to aim toward. Secondly, the research confirmed that co-productive urban climate policy development could expand the scope of stakeholder engagement and enable trust-building, as suggested by co-production scholarship, while not facilitating the co-equal distribution of decision-making authority and power need to produce novel policy outcomes. Finally, the procedural consequences and impacts of this co-productive process do not necessarily support innovative co-produced policy outcomes. Through its empirical analysis, this research has made a distinctive contribution to knowledge. Next, the thesis will reflect and consider what these contributions mean for future research and practice.

9.2 Implications for future research & practice

In this final section of the thesis, I reflect on what this research's contributions mean for future scholarship and policy. As many local governments continue to urgently consider how to scale up and accelerate their climate policy ambitions, this thesis's findings provide new understandings that can inform future research and policy. Although there is optimism that nation-states will take high-level action at COP26 in Glasgow in 2021, some have proposed the current climate policy window as a potential era for 'climate urbanism' — a paradigm in which cities are the most appropriate and viable sites for transformative climate action, where urban climate policy intersects with other societal challenges such as wealth inequality and social justice (Long & Rice 2019). As the climate crisis continues to worsen and accelerate, urban areas across the UK, Europe, and the globe have declared a wave of 'climate emergencies' and redoubled their efforts to facilitate aggressive climate policy action. If cities are to facilitate the ambitious scale of climate action demanded in the face of the crisis, new urban climate policy development approaches will need to be tested, evaluated and refined through conceptual and practical discourses, as has been done in this thesis.

Meanwhile, there are clear needs for public participation to influence urban climate policy, and co-production approaches remain salient. Some scholars have proposed that ongoing urban injustices such as the diminishing supply of affordable housing, the widening gap in economic inequality, and systemic racial oppression can only be rectified by historically marginalised groups gaining meaningful representation in policy development processes (see Brenner, Marcuse & Mayer 2012). Layered on top of these deep-seated urban injustices are growing

calls from citizens, activists, and community organisations for citizens to gain more significant influence in policy decision-making (Hughes, Chu & Mason 2018; O'brien, Selboe & Hayward 2018). The Extinction Rebellion movement has campaigned for citizens to participate in climate policy development, which, in the UK, has led to the recently concluded Climate Assembly UK. Similarly, the Black Lives Matter movement that began in North America and has spread across the globe has called for — amongst specific demands — local communities to guide the process of reallocating portions of local government resources away from policing into expanded social services. As evidenced by these urban injustices and social movements, public participation and co-production are significant for continued theoretical and practical exploration.

This thesis has achieved learning and produced knowledge that should be brought forward into these contemporary and future research and policy agendas. To ensure the learning that resulted from this research is shared with GMCA, I am developing a policy brief that will be shared with the organisation and other local government organisations interested in the findings. Furthermore, the findings from this research have been shared through several governance bodies overseeing the 5-Year Environment Plan that are constituted of external stakeholders. Lastly, the research is being shared with climate activism organisations in Greater Manchester through workshops and events with campaigners.

While this research's findings provide understandings that can be taken forward to inform theory and practice, this research also raises additional questions that merit investigation. As I outlined above, the climate crisis and social injustices that urban areas are grappling with are not new. Instead, these crises as they currently manifest are the consequence of long ignored, under-addressed accelerating challenges. This makes the need to utilise past learnings and knowledge to inform future research agendas all the more crucial.

The first question the findings of this thesis raises for future research and practice is, *in a context of accelerating climate breakdown, widening economic dislocation, and political instability, is co-production an appropriate policy development approach for local governments to adopt given co-production's substantial demands to facilitate?* As I explored in the conceptual framework, co-production is an approach that requires significant resources and capacity to facilitate. Co-production has been critiqued extensively for placing sizeable demands on those involved in leading these processes. As every individual and organisation

has a finite amount of capacity, resources, and time, the material requirements of co-production must be considered seriously if the approach is to be led and managed effectively in a manner that may support transformative change. If local government organisations are to use co-production to facilitate robust, high levels of public participation to address wicked social challenges, careful forethought needs to be given to co-production's demanding resource and capacity requirements.

In addition to the demands placed on the organisations leading co-productive arrangements, these processes also require significant capacity and resource contributions from those engaged as participants. As I assessed in the conceptual framework, co-production strives to develop deep partnerships between those involved in the given co-productive process by supporting shared sacrifices and contributions to pursue common objectives. Because of the demands placed on those participating in a co-productive process, there is a need to consider whether this approach is fair and equitable for involved participants. Furthermore, many marginalised groups already struggle to overcome resource and capacity insufficiencies that, in part, preserve structural oppressions (see Harvey 2008). If these groups are to engage in co-productive processes that seek to address wicked social issues, it is necessary to consider how the additional demands of participating in that process may challenge and place a further burden on these groups. As participants in co-productive processes also face resource and capacity requirements, there is a need to consider whether those demands lead co-production to produce more socially just policy outcomes or unintentionally continue the exploitation of the community's co-production seeks to benefit.

The second question this thesis's findings raise for future research and practice is, *is it possible for co-productive urban climate policy development approaches to engage the diverse range of perspectives that may exist and enable them to negotiate policy outcomes together as co-equal partners?* As I analysed in the conceptual framework, co-production aspires to build deep partnerships between the individuals and organisations involved in these processes to share co-equal decision-making power. The conceptual framework also assessed one critical constraint within traditional approaches as the narrow forms of policy contestation and debate that takes place between a limited set of perspectives, primarily contributed by technical practitioners. If an urban climate policy development process is to determine meaningful policy outcomes to the scale demanded of the crisis while simultaneously centring the needs of marginalised and vulnerable communities, rigourous forms of policy contestation and

negotiation are needed between diverse perspectives. Furthermore, the local government organisations that lead these climate policy development processes will need to share power for the policy outcomes determined through these processes to be realised.

While it appears co-production may be an appropriate policy development approach to address the present urban societal challenge posed above, the second question this research has raised profoundly asks whether or not co-productive policy development is achievable. This research has found that time, resources and capacity alone are insufficient to achieve policy outcomes determined through inclusive public engagement and debate within a co-productive process. Rather, co-production requires these capabilities and, crucially, significant cultural changes and a particular set of values. Local government organisations attempting to foster co-productive policy development approaches cannot do so using technocratic models they have traditionally utilised. In addition to its material demands, co-production requires fundamental changes to the way local government organisations perceive themselves and others. This second question seeks to examine whether co-production can facilitate these deeper philosophical shifts needed to achieve co-production's potential benefits.

As the climate crisis accelerates and innovative public participation approaches continue to be needed to solve intensifying societal challenges, co-production remains a relevant area for exploration. This thesis has produced notable findings that have implications for future scholarship and policy. If researchers and policymakers are to successfully solve contemporary challenges, they must utilise past learnings in their actions. While this thesis has not conclusively suggested or argued that co-productive urban policy development could be a panacea for resolving climate change, the research has demonstrated that co-production can produce some advantageous outcomes distinctly from conventional approaches. This thesis has also upheld some critiques of co-production made by scholars and has offered some additional shortcomings of co-productive policy development in the context of climate politics. The climate crisis and other challenges we currently face and will continue to confront are extensive and complex. This thesis serves as a modest but serious source of knowledge that can help researchers and policymakers working in these areas of complexity make progress towards realising a more just, habitable society.

References

Documents & Press Releases:

City of Amsterdam. (2020). Policy: Circular economy. Retrieved from https://www.amsterdam.nl/en/policy/sustainability/circular-economy/

Manchester: Knowledge Capital. (2007). Manchester is My Planet: Programme review.http://www.worldcapitalinstitute.org/wp-content/uploads/2018/05/MiMP_Review0751.pdf

Greater Manchester City Deal. (2012). Deputy Prime Minister's Office. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/221014/Greater-Manchester-City-Deal-final_0.pdf

Greater Manchester Combined Authority (2016). Climate Change and Low Emissions Implementation Plan 2016-2020. https://www.greatermanchester-ca.gov.uk/media/1273/climate-change-and-low-emisson-implementation-plan.pdf

Burnham for Mayor (2017). Our Manifesto for the Greater Manchester. https://d3n8a8pro7vhmx.cloudfront.net/andy4mayor/pages/68/attachments/original/1489493923/Andy_Burham_Manifesto_A4_12pp_copy.pdf?1489493923

Greater Manchester Combined Authority (2018). Greater Manchester's Springboard to a Green City Region. https://www.greatermanchester-ca.gov.uk/media/1317/springboard-report.pdf

Greater Manchester Combined Authority (2019). 5-Year Environment Plan for Greater Manchester. https://www.greatermanchester-ca.gov.uk/media/1986/5-year-plan-branded_3.pdf

Greater Manchester Combined Authority (2019). Minutes of the Greater Manchester Combined Authority Meeting Held on 29 March 2019 at Stockport Council. https://committees.oldham.gov.uk/documents/s107326/GMCA_29_March_2019_1.pdf

Parliament. House of Commons. (2020). The path to net zero: Climate Assembly UK. https://www.climateassembly.uk/report/read/final-report.pdf

Works Cited:

Agar, M. H. (1996). *The professional stranger: An informal introduction to ethnography* (Vol. 2). San Diego, CA: Academic press.

Agger, A. (2010). Involving citizens in sustainable development: evidence of new forms of participation in the Danish Agenda 21 schemes. *Local Environment*, *15*(6), 541-552.

Alford, J. (2014). The multiple facets of co-production: Building on the work of Elinor Ostrom. *Public Management Review*, *16*(3), 299-316.

Anderson, B., & M'Gonigle, M. (2012). Does ecological economics have a future?: Contradiction and reinvention in the age of climate change. *Ecological Economics*, *84*, 37-48.

Anderson, K., & Peters, G. (2016). The trouble with negative emissions. *Science*, *354*(6309), 182-183.

Angrosino, M. (2007). *Doing ethnographic and observational research*. Sage.

Anguelovski, I., Chu, E., & Carmin, J. (2014). Variations in approaches to urban climate adaptation: Experiences and experimentation from the global South. *Global Environmental Change*, *27*, 156-167.

Atkinson, P., Coffey, A., Delamont, S., Lofland, J., & Lofland, L. (Eds.). (2001). *Handbook of ethnography*. Sage.

Atkinson, P., & Hammersley, M. (1998). Ethnography and participant observation. *Strategies of Qualitative Inquiry. Thousand Oaks: Sage*, 248-261.

Attride-Stirling, J. (2001). Thematic networks: an analytic tool for qualitative research. *Qualitative Research*, *1*(3), 385-405.

Archer, D., & Dodman, D. (2015). Making capacity building critical: Power and justice in building urban climate resilience in Indonesia and Thailand. *Urban Climate*, *14*, 68-78.

Arrow, K., Bolin, B., Costanza, R., Dasgupta, P., Folke, C., Holling, C. S., ... & Pimentel, D. (1995). Economic growth, carrying capacity, and the environment. *Ecological Economics*, *15*(2), 91-95.

Bache, I., Flinders, M. V., Fairbrass, J., & Jordan, A. (2004). Multi-level Governance and environmental policy. In *Multi-Level Governance* (pp. 147–164). Oxford University Press.

Bäckstrand, K. (2004). Scientisation vs. civic expertise in environmental governance: Eco-feminist, eco-modern and post-modern responses. *Environmental Politics*, *13*(4), 695-714.

Banks, S., Armstrong, A., Carter, K., Graham, H., Hayward, P., Henry, A., ... & Moore, N. (2013). Everyday ethics in community-based participatory research. *Contemporary Social Science*, *8*(3), 263-277.

Béné, C., Mehta, L., McGranahan, G., Cannon, T., Gupte, J., & Tanner, T. (2018). Resilience as a policy narrative: potentials and limits in the context of urban planning. *Climate and Development*, *10*(2), 116-133.

Bellinson, R. G. (2018). Connecting the dots: The politics of governing urban climate adaptation innovations through transnational municipal networks. In *Climate Change in Cities* (pp. 183-202). Springer, Cham.

Bellinson, R., & Chu, E. (2019). Learning pathways and the governance of innovations in urban climate change resilience and adaptation. *Journal of Environmental Policy & Planning*, *21*(1), 76-89.

Bendell, J. (2018). Deep adaptation: A map for navigating climate tragedy.

Berner, M. M., Amos, J. M., & Morse, R. S. (2011). What constitutes effective citizen participation in local government? Views from city stakeholders. *Public Administration Quarterly*, 128-163.

Black, R., Bennett, S. R., Thomas, S. M., & Beddington, J. R. (2011). Climate change: Migration as adaptation. *Nature*, *478*(7370), 447-449.

Blackler, F. (1995). Knowledge, knowledge work and organizations: An overview and interpretation. *Organization Studies*, *16*(6), 1021-1046.

Blomkamp, E. (2018). The promise of co-design for public policy. *Australian Journal of Public Administration*, *77*(4), 729-743.

Bourke, B. (2014). Positionality: Reflecting on the research process. *The Qualitative Report*, *19*(33), 1-9.

Bovaird, T. (2007). Beyond engagement and participation: User and community coproduction of services. *Public Administration Review*, *67*(5), 846-860

Bovaird, T., Van Ryzin, G. G., Loeffler, E., & Parrado, S. (2015). Activating citizens to participate in collective co-production of public services. *Journal of Social Policy*, *44*(1), 1-23.

Bradbury, P. R. H. (2001). *Handbook of action research: Participative inquiry and practice*. Sage Publications.

Brandsen, T., & Pestoff, V. (2006). Co-production, the third sector and the delivery of public services: An introduction. *Public Management Review*, *8*(4), 493-501.

Brannick, T., & Coghlan, D. (2007). In defence of being "native": The case for insider academic research. *Organizational Research Methods*, *10*(1), 59-74.

Brenner, N., Marcuse, P., & Mayer, M. (Eds.). (2012). *Cities for people, not for profit: Critical urban theory and the right to the city*. Routledge.

Brewer, J. (2000). *Ethnography*. McGraw-Hill Education (UK).

Bruce, A., & O'Callaghan, K. (2016). Inside out: knowledge brokering by short-term policy placements. *Evidence & Policy: A Journal of Research, Debate and Practice*, *12*(3), 363-380.

Bulkeley, H. (2016). *Accomplishing climate governance.* Cambridge University Press.

Bulkeley, H., & Betsill, M. M. (2013). Revisiting the urban politics of climate change. *Environmental Politics*, *22*(1), 136-154.

Bulkeley, H., & Kern, K. (2006). Local government and the governing of climate change in Germany and the UK. *Urban Studies*, *43*(12), 2237-2259.

Bulkeley, H., & Newell, P. (2015). *Governing climate change*. Routledge.

Bulkeley, H., Schroeder, H., Janda, K., Zhao, J., Armstrong, A., Chu, S. Y., & Ghosh, S. (2009). Cities and climate change: the role of institutions, governance and urban planning. *Change*, *28*, 30.

Burawoy, M. (1998). The extended case method. *Sociological Theory*, *16*(1), 4-33.

Bussu, S., & Tullia Galanti, M. (2018). Facilitating coproduction: the role of leadership in coproduction initiatives in the UK. *Policy and Society*, *37*(3), 347-367.

Cadman, T., Radunsky, K., Simonelli, A., & Maraseni, T. (2018). From Paris to Poland: A Postmortem of the Climate Change Negotiations. *The International Journal of Social Quality*, *8*(2), 27-46.

Cai, G. H., Du, Y. J., Liu, S. Y., & Singh, D. N. (2015). Physical properties, electrical resistivity, and strength characteristics of carbonated silty soil admixed with reactive magnesia. *Canadian Geotechnical Journal*, *52*(11), 1699-1713.

Campbell, H. J., & Vanderhoven, D. (2016). Knowledge that matters: Realising the potential of co-production.

Campbell, J. L., Quincy, C., Osserman, J., & Pedersen, O. K. (2013). Coding in-depth semistructured interviews: Problems of unitization and intercoder reliability and agreement. *Sociological Methods & Research*, *42*(3), 294-320.

Capabilities in Academic Policy Engagement. (2021). About CAPE. https://www.cape.ac.uk

Carter, N. (2014). The politics of climate change in the UK. *Wiley Interdisciplinary Reviews: Climate Change*, *5*(3), 423-433.

Castan Broto, V. (2017). Urban governance and the politics of climate change. *World Development*, *93*, 1-15.

Creutzig, F., Baiocchi, G., Bierkandt, R., Pichler, P. P., & Seto, K. C. (2015). Global typology of urban energy use and potentials for an urbanization mitigation wedge. *Proceedings of the National Academy of Sciences*, *112*(20), 6283-6288.

Christensen, T., & Lægreid, P. (2002). New public management: Puzzles of democracy and the influence of citizens. *Journal of Political Philosophy*, *10*(3), 267-295.

Coaffee, J., & Healey, P. (2003). 'My voice: My place': Tracking transformations in urban governance. *Urban studies*, *40*(10), 1979-1999.

Coenen, F. (2009). Local Agenda 21: 'Meaningful and effective' participation?. In *Public participation and better environmental decisions* (pp. 165-182). Springer, Dordrecht.

Coghlan, D. (2007). Insider action research doctorates: Generating actionable knowledge. *Higher Education*, *54*(2), 293-306.

Collins, H., & Evans, R. (2008). *Rethinking expertise*. University of Chicago Press.

Davidson, K., Briggs, J., Nolan, E., Bush, J., Håkansson, I., & Moloney, S. (2020). The making of a climate emergency response: Examining the attributes of climate emergency plans. *Urban Climate*, *33*, 100666.

Deas, I. (2014). The search for territorial fixes in subnational governance: City-regions and the disputed emergence of post-political consensus in Manchester, England. *Urban Studies*, *51*(11), 2285-2314.

Deas, I., Haughton, G., & Ward, K. (2020). Scalar postpolitics, inclusive growth and inclusive economies: challenging the Greater Manchester agglomeration model. *Cambridge Journal of Regions, Economy and Society*.

Durose, C., & Richardson, L. (2015). Designing public policy for co-production: Theory, practice and change. Policy Press.

England, K. V. (1994). Getting personal: Reflexivity, positionality, and feminist research. *The Professional Geographer*, *46*(1), 80-89.

Evans, J., & Karvonen, A. (2014). 'Give me a laboratory and I will lower your carbon footprint!'—Urban laboratories and the governance of low-carbon futures. *International Journal of Urban and Regional Research*, *38*(2), 413-430.

Fankhauser, S., & Tol, R. S. (2005). On climate change and economic growth. *Resource and Energy Economics*, *27*(1), 1-17.

Farr, M. (2018). Power dynamics and collaborative mechanisms in co-production and co-design processes. *Critical Social Policy*, *38*(4), 623-644.

Fischer, C., & Newell, R. G. (2008). Environmental and technology policies for climate mitigation. *Journal of Environmental Economics and Management*, *55*(2), 142-162.

Fischer, F. (2017). *Climate crisis and the democratic prospect: participatory governance in sustainable communities*. Oxford University Press.

Fridahl, M., & Linnér, B. O. (2016). Perspectives on the Green Climate Fund: possible compromises on capitalization and balanced allocation. *Climate and Development*, *8*(2), 105-109.

Fledderus, J., Brandsen, T., & Honingh, M. (2014). Restoring trust through the co-production of public services: A theoretical elaboration. *Public Management Review*, *16*(3), 424-443.

Flinders, M., Wood, M., & Cunningham, M. (2016). The politics of co-production: risks, limits and pollution. *Evidence & Policy: A Journal of Research, Debate and Practice*, *12*(2), 261-279.

Flyvbjerg, B. (2006). Five misunderstandings about case-study research. *Qualitative Inquiry*, *12*(2), 219-245.

Fuss, S., Canadell, J. G., Peters, G. P., Tavoni, M., Andrew, R. M., Ciais, P., ... & Le Quéré, C. (2014). Betting on negative emissions. *Nature Climate Change*, *4*(10), 850-853.

Garfinkel, H. (1967). What is ethnomethodology. *Studies in Ethnomethodology*.

Geertz, C. (1973). Thick description: Toward an interpretive theory of culture. *Turning points in qualitative research: Tying knots in a handkerchief*, *3*, 143-168.

Genzuk, M. (2003). A synthesis of ethnographic research. *Occasional Papers Series. Center for Multilingual, Multicultural Research (Eds.). Center for Multilingual, Multicultural Research, Rossier School of Education, University of Southern California. Los Angeles*, 1-10.

Gough, C., & Vaughan, N. E. (2015). Synthesising existing knowledge on the feasibility of BECCS. *AVOID2 Report WPD1a*.

Gregory, R. (2017). New Public Management and the ghost of Max Weber: Exorcized or still haunting?. In *Transcending New Public Management* (pp. 233-256). Routledge.

Guinan, J., & O'Neill, M. (2019). From community wealth-building to system change. *IPPR Progressive Review*, *25*(4), 382-392.

Gupta, J. (2010). A history of international climate change policy. *Wiley Interdisciplinary Reviews: Climate Change*, *1*(5), 636-653.

Harris, L. M., Chu, E. K., & Ziervogel, G. (2018). Negotiated resilience. *Resilience*, *6*(3), 196-214.

Harvey, D. (2008). The right to the city. *The City Reader*, *6*(1), 23-40.

Healey, P. (1998). Collaborative planning in a stakeholder society. *Town Planning Review*, *69*(1), 1.

Hodson, M., Marvin, S., & Bulkeley, H. (2013). The intermediary organisation of low carbon cities: A comparative analysis of transitions in Greater London and Greater Manchester. *Urban Studies*, *50*(7), 1403-1422.

Hood, C. (1995). The "new public management" in the 1980s: Variations on a theme. *Accounting, Organizations and Society*, *20*(2-3), 93-109.

Hughes, S. (2017). The politics of urban climate change policy: Toward a research agenda. *Urban Affairs Review*, *53*(2), 362-380.

IPCC. (2013). *Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* [Stocker, T.F., D. Qin, G.-K. Plattner, M. Tignor, S.K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex and P.M. Midgley (eds.)]. Cambridge University Press.

Jasanoff, S. (Ed.). (2004). *States of knowledge: The co-production of science and the social order*. Routledge.

Jennings, T. L. (2011). Transcending the adaptation/mitigation climate change science policy debate: Unmasking assumptions about adaptation and resilience. *Weather, Climate, and Society*, *3*(4), 238-248.

Jones, G. W. (1973). The Local Government Act 1972 and the Redcliffe-Maud Commission. *The Political Quarterly*, *44*(2), 154-166.

Jonsen, K., & Jehn, K. A. (2009). Using triangulation to validate themes in qualitative studies. *Qualitative Research in Organizations and Management: An International Journal*.

Joshi, A., & Moore, M. (2004). Institutionalised co-production: Unorthodox public service delivery in challenging environments. *Journal of Development Studies*, *40*(4), 31-49.

Kabisch, N., Korn, H., Stadler, J., & Bonn, A. (2017). Nature-based solutions to climate change adaptation in urban areas. *Theory and Practice of Urban Sustainability Transitions*. Kern & Alber 2009

Kern, K., & Alber, G. (2009). Governing climate change in cities: Modes of urban climate governance in multi-level systems. *Competitive Cities and Climate Change*, 171–196.

Klenk, N., Fiume, A., Meehan, K., & Gibbes, C. (2017). Local knowledge in climate adaptation research: Moving knowledge frameworks from extraction to co-production. *Wiley Interdisciplinary Reviews: Climate Change*, *8*(5), e475.

Klein, N. (2015). *This changes everything: Capitalism vs. the climate*. Simon and Schuster.

Knox, H. (2017). Inclusion without incorporation: Re-imagining Manchester through a new politics of environment. In *Realising the city*. Manchester University Press.

Lahsen, M. (2016). Trust through participation? Problems of knowledge in climate decision making. In *The social construction of climate change* (pp. 197-220). Routledge.

Lazarus, R. J. (2008). Super wicked problems and climate change: Restraining the present to liberate the future. *Cornell L. Rev.*, *94*, 1153.

Le Gallais, T. (2003). From native to stranger-and back again? Questions for reflective practitioners. *British Educational Research Association Annual Conference*.

Lefebvre, H. (1970), [2003]. *The Urban Revolution*. U of Minnesota Press.

Lee, T., & Koski, C. (2015). Multilevel governance and urban climate change mitigation. *Environment and Planning C: Government and Policy*, *33*(6), 1501-1517.

Lee, T. M., Markowitz, E. M., Howe, P. D., Ko, C. Y., & Leiserowitz, A. A. (2015). Predictors of public climate change awareness and risk perception around the world. *Nature Climate Change*, *5*(11), 1014-1020.

Leichenko, R. (2011). Climate change and urban resilience. *Current Opinion in Environmental Sustainability*, *3*(3), 164-168.

Lemoine, D., & Traeger, C. (2014). Watch your step: Optimal policy in a tipping climate. *American Economic Journal: Economic Policy*, *6*(1), 137-66.

Levin, K., Cashore, B., Bernstein, S., & Auld, G. (2007). Playing it forward: Path dependency, progressive incrementalism, and the 'Super Wicked' problem of global climate change. In *International Studies Association 48th Annual Convention. Chicago, February*.

Lewis, S. J., & Russell, A. J. (2011). Being embedded: A way forward for ethnographic research. *Ethnography*, *12*(3), 398-416.

Li, J. (2008). Ethical Challenges in Participant Observation: A Reflection on Ethnographic Fieldwork. *Qualitative Report*, *13*(1), 100-115.

Little, P. E. (1995). Ritual, power and ethnography at the Rio Earth Summit. *Critique of Anthropology*, *15*(3), 265-288.

Long, J., & Rice, J. L. (2019). From sustainable urbanism to climate urbanism. *Urban Studies*, *56*(5), 992-1008.

Lukes, S. (2004). *Power: A radical view*. Macmillan International Higher Education.

MacArthur, J. L. (2016). Challenging public engagement: Participation, deliberation and power in renewable energy policy. *Journal of Environmental Studies and Sciences*, *6*(3), 631-640.

MacKillop, F. (2012). Climatic city: Two centuries of urban planning and climate science in Manchester (UK) and its region. *Cities*, *29*(4), 244-251.

Marcus, S. (2015). *Engels, Manchester, and the working class*. Transaction Publishers.

Marcus, G. E. (2008). The end(s) of ethnography: Social/cultural anthropology's signature form of producing knowledge in transition. *Cultural Anthropology*, *23*(1), 1-14.

Marsden, G., Ferreira, A., Bache, I., Flinders, M., & Bartle, I. (2014). Muddling through with climate change targets: a multi-level governance perspective on the transport sector. *Climate Policy*, *14*(5), 617-636.

May, T., & Perry, B. (2010). *Social research and reflexivity*. Sage.

May, T., & Perry, B. (2017). *Reflexivity: The essential guide*. Sage.

McAdam, D. (2017). Social movement theory and the prospects for climate change activism in the United States. *Annual Review of Political Science*, *20*, 189-208.

McLachlan, C. (2018). Quantifying the implications of the Paris Agreement for the city of Manchester.

Meerow, S., Newell, J. P., & Stults, M. (2016). Defining urban resilience: A review. *Landscape and Urban Planning*, 147, 38–49.

Meerow, S., & Stults, M. (2016). Comparing conceptualizations of urban climate resilience in theory and practice. *Sustainability*, *8*(7), 701.

Merriam, S. B., Johnson-Bailey, J., Lee, M. Y., Kee, Y., Ntseane, G., & Muhamad, M. (2001). Power and positionality: Negotiating insider/outsider status within and across cultures. *International Journal of Lifelong Education*, *20*(5), 405-416.

Michaels, S. (2009). Matching knowledge brokering strategies to environmental policy problems and settings. *Environmental Science & Policy*, *12*(7), 994-1011.

Milligan, L. (2016). Insider-outsider-inbetweener? Researcher positioning, participative methods and cross-cultural educational research. *Compare: A Journal of Comparative and International Education*, *46*(2), 235-250.

Milman, O. (2019). 'Greta Thunberg condemns world leaders in emotional speech at UN'. *The Guardian*. https://www.theguardian.com/environment/2019/sep/23/greta-thunberg-speech-un-2019-address [accessed 7 December 2019]

Mogalakwe, M. (2009). The documentary research method–using documentary sources in social research. *Eastern Africa Social Science Research Review*, *25*(1), 43-58.

Monti, D. J. (1992). On the risks and rewards of "going native". *Qualitative Sociology*, *15*(3), 325-332.

Morgan, J. (2016). Paris COP 21: Power that speaks the truth?. *Globalizations*, *13*(6), 943-951.

Moser, S. C. (2020). The work after "It's too late" (to prevent dangerous climate change). *Wiley Interdisciplinary Reviews: Climate Change*, *11*(1), e606.

Muir, J. (2008). 'Are you taking notes on us? 'Reflections on case study research in urban environments. In *Qualitative Urban Analysis: An International Perspective*. Emerald Group Publishing Limited.

Needham, C. (2008). Realising the potential of co-production: Negotiating improvements in public services. *Social Policy and Society*, *7*(2), 221.

Niemeyer, S. (2013). Democracy and climate change: What can deliberative democracy contribute?. *Australian Journal of Politics & History*, *59*(3), 429-448.

O'brien, K., Selboe, E., & Hayward, B. M. (2018). Exploring youth activism on climate change. *Ecology and Society*, *23*(3).

O'Brien, K. L., & Wolf, J. (2010). A values-based approach to vulnerability and adaptation to climate change. *Wiley Interdisciplinary Reviews: Climate Change*, *1*(2), 232-242.

Okereke, C., Wittneben, B., & Bowen, F. (2012). Climate change: Challenging business, transforming politics. *Business & Society*, *51*(1), 7-30.

Oliver, K., Kothari, A., & Mays, N. (2019). The dark side of coproduction: do the costs outweigh the benefits for health research?. *Health Research Policy and Systems*, *17*(1), 33.

On the Platform (2018). 'Green Summit heralds bold green future for Greater Manchester', 21 March 2018. http://gmgreencity.com/article/green-summit-heralds-bold-green-future-greater-manchester [accessed 19 June 2018]

Ostrom, E. (1979). Productivity in the urban public sector. In *Conference on Comparative Urban Policy Research, University of Chicago*.

Ostrom, E. (1996). Crossing the great divide: Coproduction, synergy, and development. *World Development*, *24*(6), 1073-1087.

Ostrom, E., Parks, R. B., Whitaker, G. P., & Percy, S. L. (1978). The public service production process: A framework for analyzing police services. *Policy Studies Journal*, *7*, 381.

Owens, S. (2000). 'Engaging the public': Information and deliberation in environmental policy. *Environment and Planning A*, *32*(7), 1141-1148.

Parks, R. B., Baker, P. C., Kiser, L., Oakerson, R., Ostrom, E., Ostrom, V., ... & Wilson, R. (1981). Consumers as coproducers of public services: Some economic and institutional considerations. *Policy Studies Journal*, *9*(7), 1001-1011.

Patterson, J. J., Thaler, T., Hoffmann, M., Hughes, S., Oels, A., Chu, E., ... & Jordan, A. (2018). Political feasibility of 1.5° C societal transformations: the role of social justice. *Current Opinion in Environmental Sustainability*, *31*, 1-9.

Pierrehumbert, R. (2019). There is no Plan B for dealing with the climate crisis. *Bulletin of the Atomic Scientists*, *75*(5), 215-221.

Perry, B., & Atherton, M. (2017). Beyond critique: The value of co-production in realising just cities?. *Local Environment*, *22*(sup1), 36-51.

Perry, B., & Habermehl, V. (2020). The risk of austerity co-production in city-regional governance in England. *International Journal of Urban and Regional Research*.

Perry, B., Diprose, K., Kings, S., Habermehl, V., Hine, I., May, T., Russell, B., Simpson, V., Spring, C. and Taylor Buck, N., with Bellinson, R., McVicar-Payling, A. and Patient, J. (2019) Realising Just Cities: An overview of activity 2016-2019, Sheffield.

Perry, B., Russell, B., Durose, C., Richardson, L., & Whinnom, A. (2019). Jam and Justice: Co-producing urban governance for social Innovation, ESRC & Mistra Urban Futures. *Impact*, *2019*(1), 34-40.

Peters, B. G., & Peters, G. (2002). *Politics of bureaucracy*. Routledge.

Pollack, S., & Eldridge, T. (2015). Complicity and redemption: Beyond the insider/outsider research dichotomy. *Social Justice*, *42*(2 (140), 132-145.

Popper, K. R. (1972). *Objective knowledge* (Vol. 360). Oxford: Oxford University Press.

Raworth, K. (2017). *Doughnut economics: Seven ways to think like a 21st-century economist*. Chelsea Green Publishing.

Raworth, K. (2020). The Amsterdam city doughnut–A tool for transformative action. *Doughnut Economics Action Lab*.

Reiter-Theil, S. (2004). Does empirical research make bioethics more relevant? "The embedded researcher" as a methodological approach. *Medicine, Health Care and Philosophy*, *7*(1), 17-29.

Rice, J. L., Burke, B. J., & Heynen, N. (2015). Knowing climate change, embodying climate praxis: Experiential knowledge in Southern Appalachia. *Annals of the Association of American Geographers*, *105*(2), 253-262.

Rickards, L., Wiseman, J., & Kashima, Y. (2014). Barriers to effective climate change mitigation: the case of senior government and business decision makers. *Wiley Interdisciplinary Reviews: Climate Change*, *5*(6), 753-773.

Ripple, W., Wolf, C., Newsome, T., Barnard, P., Moomaw, W., & Grandcolas, P. (2019). World scientists' warning of a climate emergency. *BioScience*.

Robinson, S. (2009). Manchester is My Planet Pledge Campaign, Manchester, UK. Case study for WP2 (Analysis of success factors, underlying models and methods of target group interaction) of the EC FP7 project Changing Behaviour.

Rosenzweig, C., Solecki, W. D., Romero-Lankao, P., Mehrotra, S., Dhakal, S., & Ibrahim, S. A. (Eds.). (2018). *Climate change and cities: Second assessment report of the urban climate change research network*. Cambridge University Press.

Rutland, T., & Aylett, A. (2008). The work of policy: Actor networks, governmentality, and local action on climate change in Portland, Oregon. *Environment and Planning D: Society and Space*, *26*(4), 627-646.

Ryberg, M. W., Owsianiak, M., Richardson, K., & Hauschild, M. Z. (2016). Challenges in implementing a planetary boundaries based life-cycle impact assessment methodology. *Journal of Cleaner Production*, *139*, 450-459.

Sánchez-Jankowski, M. (2002). Representation, responsibility and reliability in participant-observation. *Qualitative Research in Action*, 144-160.

Satterthwaite, D. (2016). Successful, safe and sustainable cities: Towards a New Urban Agenda. *Commonwealth Journal of Local Governance*, 3-18.

Scheffer, M., Carpenter, S., Foley, J. A., Folke, C., & Walker, B. (2001). Catastrophic shifts in ecosystems. *Nature*, *413*(6856), 591-596.

Schmeer, K. (1999). Stakeholder Analysis Guidelines. Policy Toolkit for Strengthening Health Sector Reform, 1-35.

Schrag, D. P. (2007). Preparing to capture carbon. *Science*, *315*(5813), 812-813.

Schröder, E., & Storm, S. (2018). Economic growth and carbon emissions: The road to 'Hothouse Earth' is paved with good intentions. *Institute for New Economic Thinking*.

Scott, J. (2014). *A matter of record: Documentary sources in social research*. John Wiley & Sons.

Shi, L., Chu, E., Anguelovski, I., Aylett, A., Debats, J., Goh, K., ... & Roberts, J. T. (2016). Roadmap towards justice in urban climate adaptation research. *Nature Climate Change*, *6*(2), 131-137.

Schwartz-Shea, P., & Yanow, D. (2013). *Interpretive research design: Concepts and processes*. Routledge.

Sillmann, J., Lenton, T. M., Levermann, A., Ott, K., Hulme, M., Benduhn, F., & Horton, J. B. (2015). Climate emergencies do not justify engineering the climate. *Nature Climate Change*, *5*(4), 290-292.

Slavin, M. I., & Snyder, K. (2011). Strategic climate action planning in Portland. In *Sustainability in America's Cities* (pp. 21-44). Island Press, Washington, DC.

Small, M. L. (2009). How many cases do I need?' On science and the logic of case selection in field-based research. *Ethnography*, *10*(1), 5-38.

Smith, D. E. (2005). *Institutional ethnography: A sociology for people*. Rowman Altamira.

Sørensen, E., & Torfing, J. (2003). Network politics, political capital, and democracy. *International Journal of Public Administration*, *26*(6), 609-634.

Steffen, W., Rockström, J., Richardson, K., Lenton, T. M., Folke, C., Liverman, D., ... & Donges, J. F. (2018). Trajectories of the Earth System in the Anthropocene. *Proceedings of the National Academy of Sciences*, *115*(33), 8252-8259.

Swyngedouw, E., & Heynen, N. C. (2003). Urban political ecology, justice and the politics of scale. *Antipode*, *35*(5), 898-918.

Taylor, A. (2017). Urban climate adaption as a process of organisaitonal decision making.

Taylor, M., Gayle, D., & Brooks, L. (2019). Extinction Rebellion keeps control of major London sites into a third day. *The Guardian. https://www.theguardian.com/*

environment/2019/oct/06/extinction-rebellion-fresh-protests-shut-down-westminster [accessed 22 October 2019]

Tyler, S., & Moench, M. (2012). A framework for urban climate resilience. *Climate and Development*, *4*(4), 311-326.

Ürge-Vorsatz, D., Rosenzweig, C., Dawson, R. J., Rodriguez, R. S., Bai, X., Barau, A. S., ... & Dhakal, S. (2018). Locking in positive climate responses in cities. *Nature Climate Change*, *8*(3), 174-179.

Van de Kerkhof, M. (2006). Making a difference: On the constraints of consensus building and the relevance of deliberation in stakeholder dialogues. *Policy Sciences*, *39*(3), 279-299.

Van Manen, M. (2016). *Researching lived experience: Human science for an action sensitive pedagogy*. Routledge.

van Nes, E. H., Arani, B. M., Staal, A., van der Bolt, B., Flores, B. M., Bathiany, S., & Scheffer, M. (2016). What do you mean, 'tipping point'?. *Trends in Ecology & Evolution*, *31*(12), 902-904.

Vaughan, N. E., & Gough, C. (2016). Expert assessment concludes negative emissions scenarios may not deliver. *Environmental Research Letters*, *11*(9), 095003.

Vinten, G. (1994). Participant observation: A model for organizational investigation?. *Journal of Managerial Psychology*.

Voorberg, W. H., Bekkers, V. J., & Tummers, L. G. (2015). A systematic review of co-creation and co-production: Embarking on the social innovation journey. *Public Management Review*, *17*(9), 1333-1357.

Wadhams, P., & Davis, N. R. (2000). Further evidence of ice thinning in the Arctic Ocean. *Geophysical Research Letters*, *27*(24), 3973-3975.

Weart, S. (2003). "The Carbon Dioxide Greenhouse Effect". *The Discovery of Global Warming*. history.aip.org/climate/co2.htm

While, A., Jonas, A. E., & Gibbs, D. (2004). The environment and the entrepreneurial city: searching for the urban 'sustainability fix' in Manchester and Leeds. *International Journal of Urban and Regional Research*, *28*(3), 549-569.

Wilcox, H. A. (1975). *Hothouse Earth*. US Dept. of Defence, Navy's Ocean Farm Project.

Williams, S. (2017). Evaluating Societal Effects of Transdisciplinary Co-Production Processes. Final Report to Mistra Urban Futures.

Xu, Y., Ramanathan, V., & Victor, D. G. (2018). Global warming will happen faster than we think.

Yin, R. K. (2017). *Case study research and applications: Design and methods*. Sage Publications.

Participative Observation Field Notes:

PhD Inception Meeting. Manchester, United Kingdom. 12 October 2017.

Green Summit Steering Group Meeting. Manchester, United Kingdom. 17 October 2017.

GMCA Environment Team. Manchester, United Kingdom. 3 November 2017.

GMCA Environment Team. Manchester, United Kingdom. 4 November 2017.

GMCA Environment Team. Manchester, United Kingdom. 7 November 2017.

GMCA Environment Team. Manchester, United Kingdom. 9 November 2017.

GMCA Environment Team. Manchester, United Kingdom. 20 November 2017.

Quantum Strategy & Technology Teleconference. Manchester, United Kingdom. 23 November 2017.

GMCA Environment Team. Manchester, United Kingdom. 29 November 2017.

GMCA Environment Team. Manchester, United Kingdom. 1 December 2017.

GMCA Environment Team. Manchester, United Kingdom. 15 December 2017.

GMCA Environment Team. Manchester, United Kingdom. 18 December 2017.

GMCA Environment Team. Manchester, United Kingdom. 21 December 2017.

Green Summit Steering Group Meeting. Manchester, United Kingdom. 22 December 2017.

Green Summit Steering Group Meeting. Manchester, United Kingdom. 12 January 2018.

PhD on Communication and Engagement Supervisory Meeting. 23 January 2018.

GMCA Environment Team. Manchester, United Kingdom. 5 February 2018.

Green Summit Steering Group Meeting. Manchester, United Kingdom. 6 February 2018.

GMCA Environment Team. Manchester, United Kingdom. 20 February 2018.

Salford/Trafford Listening Events. Salford & Trafford, United Kingdom. 26 February 2018.

GMCA Environment Team. Manchester, United Kingdom. 2 March 2018.

Chorlton Park Primary School Listening Event. Manchester, United Kingdom. 3 March 2018.

Green Summit Steering Group Meeting & GMCA Environment Team Strategy Meeting. Manchester, United Kingdom. 9 March 2018.

Greater Manchester Green Summit. Manchester, United Kingdom. 21 March 2018.

GMCA Environment Team. Manchester, United Kingdom. 10 April 2018.

GMCA Environment Team. Manchester, United Kingdom. 16 April 2018.

GMCA Environment Team. Manchester, United Kingdom. 17 April 2018.

GMCA Environment Team. Manchester, United Kingdom. 7 June 2018.

GMCA Environment Team. Manchester, United Kingdom. 20 June 2018.

GMCA Environment Team. Manchester, United Kingdom. 26 June 2018.

GMCA Environment Team. Manchester, United Kingdom. 24 July 2018.

Green Summit Steering Group Meeting. Manchester, United Kingdom. 25 July 2018.

GMCA Environment Team. Manchester, United Kingdom. 10 September 2018.

GMCA Environment Team. Manchester, United Kingdom. 28 September 2018.

GMCA Environment Team. Manchester, United Kingdom. 31 October 2018.

GMCA Environment Team. Manchester, United Kingdom. 22 November 2018.

GMCA Environment Team. Manchester, United Kingdom. 28 November 2018.

GMCA Environment Team. Manchester, United Kingdom. 29 November 2018.
GMCA Environment Team. Manchester, United Kingdom. 15 December 2018.
GMCA Environment Team. Manchester, United Kingdom. 17 December 2018.
GMCA Environment Team. Manchester, United Kingdom. 8 January 2019.
GMCA Environment Team. Manchester, United Kingdom. 25 January 2019.
GMCA Environment Team. Manchester, United Kingdom. 31 January 2019.
GMCA Environment Team. Manchester, United Kingdom. 7 February 2019.
GMCA Environment Team. Manchester, United Kingdom. 20 February 2019.
GMCA Environment Team. Manchester, United Kingdom. 15 March 2019.
Greater Manchester Green Summit. Salford, United Kingdom. 25 March 2019.

Interviews Referenced:

Participant 1
Participant 2
Participant 3
Participant 4
Participant 5
Participant 6
Participant 7
Participant 8
Participant 9
Participant 10
Participant 11
Participant 12
Participant 13
Participant 14
Participant 15
Participant 16
Participant 17
Participant 18
Participant 19
Participant 20
Participant 21
GMCA Environment Team. Manchester, United Kingdom. 4 September 2018.
GMCA Environment Team. Manchester, United Kingdom. 23 May 2019.

GMCA Director of Environment. Manchester, United Kingdom. 12 June 2019.

Leader of Stockport Council. Manchester, United Kingdom. 23 May 2019.

Quantum Strategy & Technology. Manchester, United Kingdom. 5 September 2018.

GMCA Environment Team. Manchester, United Kingdom. 23 May 2019.

GMCA Environment Team Internal Documents & Memos:

Green Summit Steering Group 2017 Action Note. Manchester, United Kingdom. 15 September 2017.

Green Summit Steering Group Action Notes. Manchester, United Kingdom. 7 October 2017.

Green Summit Steering Group Action Notes. Manchester, United Kingdom. 22 December 2017.

Green Summit Steering Group Action Note. Manchester, United Kingdom. 12 January 2018.

Green Summit Steering Group Action Note. Manchester, United Kingdom. 9 March 2018.

Green Summit Steering Group Action Note. Manchester, United Kingdom. 17 April 2018.

Green Summit Steering Group Action Notes. Manchester, United Kingdom. 21 May 2018.

Green Summit Steering Group Action Note. Manchester, United Kingdom. 26 June 2018

Green Summit Steering Group Action Note. Manchester, United Kingdom. 25 July 2018.

Green Summit Steering Group Action Note. Manchester, United Kingdom. 14 September 2018.

Green Summit Steering Group Action Note. Manchester, United Kingdom. 8 January 2019.

Annex 1: Sequential Informant Interview Participants

Date of Interview	Type of stakeholder	Sector	Organisation represented
3 Sept. 2018	Active stakeholder	Public sector	Manchester Climate Change Agency
3 Sept. 2018	Active stakeholder	Volunteer/charity sector	Manchester Environmental Education Network
4 Sept. 2018	Policy professional	Public sector	Greater Manchester Combined Authority
4 Sept. 2018	Policy professional	Public sector	Greater Manchester Combined Authority
4 Sept. 2018	Active stakeholder	Campaigning sector	SERA
5 Sept. 2018	Active stakeholder	Private sector	Creative Concern
5 Sept. 2018	Active stakeholder	Private sector	Quantum Strategy & Technology
7 Sept. 2018	Active stakeholder	Campaigning sector	Manchester Friends of the Earth
7 Sept. 2018	Active stakeholder	Private sector	Anthesis Group
10 Sept. 2018	Active stakeholder	Non-profit sector	Carbon Literary Project
2 Oct. 2018	Active stakeholder	Academia	University of Sheffield
3 Oct. 2018	Active stakeholder	Non-profit sector	Carbon Co-op
21 May 2019	Policy professional	Public sector	Greater Manchester Combined Authority
21 May 2019	Active stakeholder	Campaigning sector	SERA
22 May 2019	Active stakeholder	Private sector	Anthesis Group
22 May 2019	Active stakeholder	Campaigning sector	Manchester Friends of the Earth
22 May 2019	Policy professional	Public sector	Greater Manchester Combined Authority
22 May 2019	Active stakeholder	Private sector	Red Co-op
23 May 2019	Policy professional	Public sector	Stockport Council
23 May 2019	Active stakeholder	Non-profit sector	Carbon Literary Project
23 May 2019	Active stakeholder	Academia	University Manchester
23 May 2019	Policy professional	Public sector	Greater Manchester Combined Authority
24 May 2019	Active stakeholder	Private sector	Creative Concern
24 May 2019	Active stakeholder	Public sector	Greater Manchester Centre for Voluntary Organisation
24 May 2019	Interested Citizen	Campaigning sector	Greater Manchester Climate Action Network
11 June 2019	Active stakeholder	Private sector	Your Ideal Business Partner
12 June 2019	Policy professional	Public sector	Greater Manchester Combined Authority
12 June 2019	Active stakeholder	Public sector	The Growth Company

Annex 2. Round 1 Sequential Informant Interview Guide

Introduction & warm up:

- How did you first get involved in the Green Summit process?
- Could you describe how you understood the Green Summit process when you first got involved?
- Why do you think your were selected to be formally part of the process?
- Why did you want to participant in the process?

Leadership & power in the decision-making process:

- How would you define the your role/contributions during the Green Summit process?
- Did it change over time?
- Did you define your own role or was it defined for you?
- When a decision during the process had to be made, could you have identify who had the final say?
- How did you figure out the chain of command?
- Did this have any impact on your participation in the Green Summit process?
- Did you feel like you had power to affect decisions or outcomes during the Green Summit process?
- Can you provide any examples?
- Was feeling like you had power to affect decisions or outcomes important to you? Why/why not?
- Would you say sharing power or responsibility between GMCA and outside groups or individuals was part of the Green Summit process?

Procedural & conceptual changes:

- What, if anything, do you think GMCA and local government officials have learned over the last 12 months through the Green Summit process?
- What, if anything, do you think external organisations and individuals have learned over the last 12 months through the Green Summit process?
- Can you think of an example that may have caused this learning?
- How do you think this learning has manifested into action?
- Did you deliberately try to teach others through the Green Summit process? If so how, and if not why?
- Do you think the Green Summit process began with the intention to be different than 'traditional' decision-making processes in Greater Manchester?
- How specifically do you think the process was intended to be different?
- Why do you think the process was intended to be different?
- How, if at all, do you think the Green Summit process was different from a 'traditional' decision-making process in Greater Manchester?
- Who do you think helped create these changes?
- Was anyone trying to push back and keep the process more conventional?

Participation & collaboration in the governance process:

- How would you describe your relationship with GMCA during the Green Summit process over the last 12 months? (ie passive participant, contributing advisory, invested partner, concerned advocate, etc.)
- How would you describe your relationship with the external organisations during the Green Summit process over the last 12 months?
- Did you feel like the Green Summit process promoted responsibility sharing between GMCA and external organisations?
- How do you think your input was regarded by GMCA policy officers and officials that made the final decisions during Green Summit process?
- How did you feel listened to in this process?
- How were your contributions acknowledged or utilised?
- How did you utilise or weigh the contributions of external partnerships when making final decisions during the Green Summit process?
- How were those perspectives and views similar or different from what you are usually exposed to?
- Did the contributions from external partners make your role easier or more difficult? How?
- Was this different than how you would use their contributions during a 'traditional' process?

Annex 3. Round 2 Sequential Informant Interview Guide

A co-productive process?

- This interview will focus on examining and evaluating GMCA's intentional desire to utilise co-production. The interview will specifically focus on understanding what contributions, influence and effect different people had on the process. I'd also like to share just one definition of co-production that from a scholar named Sheila Jasanoff: *co-production is an approach which attempts to enable individuals from a variety of backgrounds to share power and responsibility during a process while working together in reciprocal, caring, equal relationships*.
- Can you begin by reflecting upon the 5-Year Plan and Green Summit process. Do you think they were developed through a co-productive process?
- How did you hope to influence the process?
- Did you have the effect upon the process you hoped you would?
- What supported or enabled you to have that effect during the process?
- Were there things that constrained your ability to have an effect on the process?

Individual contributions to the process:

- Can you remind me how you first got involved with the Green Summit/5-Year Plan process?
- Can you describe how you felt about your participation to the process and how you would describe it?
- Why did you support this ongoing policy development process over a prolonged period? Was it something about the topic, the process, the people, the timing, etc.?
- Your engagement during the process was entirely/largely/partially voluntary. Why did you decide to keep supporting the process?
- Can you estimate how much time you gave towards supporting the Green Summit/developing the 5-Year Plan?
- What did your involvement mean overall in terms of managing other pressures?
- What did your 'involvement' cost? In addition to your time, did you make other forms of contribution?

Leadership, support & contributions:

- Who was leading the 5-Year Plan/Green Summit process?
- Who was making decisions?
- Can you describe how decisions were made?
- Did your ability to contribution to the 5-Year Plan development/Green Summit process change over time?
- Can you explain how you supported the 5-Year Plan's development/Green Summit process? Did you contribute your expertise, knowledge, time, money, network, staff/organisation, etc.?
- Hypothetically under what conditions would you have been enabled to contribute more?

Future-casting:

- As the 5-Year Plan spells out and was articulated at the 2019 Green Summit, delivery of this agenda will require broad support. *What do you hope to contribute moving forward?*
- Under what conditions would you be able to support the delivery of the 5-Year Plan?

- Who should be leading the 5-Year Plan's delivery process?
- What role should GMCA play?
- What role should other organisations play?
- What role would you like to see the public (citizens) play?

Annex 4: Participant Information Sheet

The Prospects and Promise of Co-Productive Urban Climate Policy Development in Greater Manchester, United Kingdom

1. What is this project about?

This research explores the role, methods, and outcomes of engagement between citizens and stakeholders with local government throughout climate change and environmental policy processes in Greater Manchester. This research will examine:

- Who is involved with facilitating citizen and stakeholder engagement with local government;
- How citizen and stakeholder engagement takes place;
- How decision-makers utilise and make sense of public engagement.

2. What activities are being undertaken?

This research takes place through an embedded research partnership where the researcher supports the Greater Manchester Combined Authority Environment Team. This consists of four activities: supporting the engagement of specialists and technical practitioners in the policy process; supporting the engagement of stakeholders and citizens; supporting communication and interface with digital engagement tools; developing an understanding of the broad climate change and environmental governance network and supporting efforts to widen the network. Interviews are also being conducted with key participants that are involved throughout climate change and environmental policy development processes.

3. Who is involved in the research?

The research will involve individuals from public, private and civil society organisations that are formally and informally involved with climate change and environmental governance in Greater Manchester. Research participants range from local government policy officers, to campaigners and activists, to local business leaders, to councillors.

4. When and how will the work take place?

The work will take place between 23 August 2018 and 31 December 2019.

5. Do I have to take part?

It is up to you whether or not to participate. If you participate, you will be given this information sheet and you may withdraw at any time for any reason without penalty.

6. What will happen if I take part?

You might be asked to participant in an interview. If you are asked for an interview and you accept, the interview will be arranged to take place at a time and place that is convenient for you.

7. What are the potential risks or disadvantages of taking part in this research?

The researcher does not anticipate that there will be negative consequences for taking part in this research. All efforts to avoid discomfort will be made.

8. What are the possible benefits of taking part in this research?

The researcher is committed to impact through their work. However, the researcher cannot guarantee there will be direct benefits from the research. The researcher hopes that participants will find their participation in the research is positive and thought-provoking.

9. Will my taking part in the research project be kept confidential?

All participants will be given the expectation that their views will be kept confidential. If you are interviewed for the research, your comments will be anonymised in any public materials. The researcher will keep all of your comments anonymous.

10. Will I be recorded and how will the recorded media be used?

Interviews may be audio recorded. These recordings are only for the use of the researcher to assist with the data analysis and to help ensure accuracy.

11. Where will the data be held and how will it be kept secure?

All of the data will be secured on the researcher's computer in an encrypted, password-protected folder. The data will also be stored on an external hard drive that will be encrypted and password-protected. The University of Sheffield will act as the Data Controller.

12. What will happen to the results of the research project?

The results of this research project will be published in the researcher's PhD dissertation. The results will also be presented to the Greater Manchester Low Carbon Hub and the Greater Manchester Combine Authority Environment Team. The results will also likely be published in academic journal articles, conference papers or book chapters.

13. Who has ethically reviewed the project?

The research has been ethically reviewed by the University of Sheffield's Ethics Review Procedure.

14. Who is organising and funding the research?

The researcher conducting this study is funded by Mistra Urban Futures - a Swedish-led research organisation.

15. Contact for further information

For further information, contact Ryan Bellinson (researcher) r.bellinson@sheffield.ac.uk

Annex 5: Participant Consent Form

The Prospects and Promise of Co-Productive Urban Climate Policy Development in Greater Manchester, United Kingdom Name of Researcher: Ryan Bellinson		
Please tick the appropriate box	**Yes**	**No**
I confirm that I have read and understand the information sheet explaining the study titled above.		
I have had the opportunity to ask questions about the project.		
I understand that my participation is voluntary and that I am free to withdraw from the study at any time without giving any reason.		
I understand that should I not wish to answer any particular question or questions, I am free to abstain without penalty or consequence.		
I understand that my responses will be kept strictly confidential. I give permission for my responses to be used by the researcher.		
I give permission for my responses to be used and quoted anonymously by the researcher in publications, reports, web pages, other research outputs. I understand that I will not be named in these outputs unless I specially request this.		
I understand that my name will not be linked with the research materials and I will not be identified or identifiable in the report or reports that result from this research.		
I agree for the anonymised data collected from me to be used in future research.		
I agree to take part in the above research project.		
_____ _____ _____ Name of Participant Date Signature _____ _____ _____ Researcher Date Signature *To be signed and dated in presence of the participant* Copies: ***Once this has been signed by all parties, the participant can request to receive a copy of the signed and dated participant consent form. The participant will not receive a copy of the signed and dated participant consent form unless requested. A copy of the signed and dated consent form will be digitally placed in a password-protected encrypted folder on the researchers computer.***		

Annex 6: Memorandum of Understanding 1

Local Governance, Environmental Planning and Community Engagement in Greater Manchester

Memorandum of Understanding

Between the University of Sheffield, the Greater Manchester Low Carbon Hub and Ryan Bellinson

This Memorandum of Understanding (MoU) sets terms and understanding between the Urban Institute, University of Sheffield and the Greater Manchester Combined Authority's (GMCA) Greater Manchester Low Carbon Hub (GMLCH) for the role, workload and responsibilities of Ryan Bellinson (PhD candidate, *Realising Just Cities*).

Background

To further build upon the previous work between researchers at the University of Sheffield's Urban Institute and decision-makers within the GMLCH as part of the *Realising Just Cities* program, Mistra Urban Futures and the University of Sheffield have provided funding to develop a PhD cluster to determine the value of co-production between research and practice. One of the PhD candidates within the cluster will specifically focus on improving city-regional communication and engagement with civil society groups and citizens, with an emphasis on climate change and environmental governance within Greater Manchester. This investment is worth over £60,000 (including fees and bursary).

The recently elected city-region mayor, Andy Burnham, has called for the scoping and eventual implementation of a new landmark environmental and climate change policy for Greater Manchester. Under the mayor's instruction, the GMLCH will spearhead the city-regional government's effort towards developing this policy. This PhD candidate, under the umbrella of the University of Sheffield's Urban Institute and Realising Just Cities program, will work with the GMLCH to help explore and develop the communicative spaces between public policy officials and civil society in the city-region.

This PhD candidate is a development that further codifies the established relationship between the University of Sheffield and the GMLCH. The PhD candidate will participate in this project through an action research study. For the PhD to have success working across the institutional boundaries of the University of Sheffield and the GMLCH, it is important for these two organisations to define clear parameters and guidelines to direct the PhD's role, workload and responsibilities.

Purpose

From October 2017 through June 2018, the PhD's main responsibility is to complete a research design to fulfil the University of Sheffield's Upgrade requirements for PhD candidates. The PhD will not proceed if this process has not been successfully passed. In order to inform the research design — as well as to create traction and build legitimacy ahead of the implementation stage of the research design — the PhD candidate will engage in ethnographic background research. One component of this ethnographic research will come in the form of working in and with the GMLCH and having regular meetings with Mark Atherton (Director Environment, Greater Manchester Environment Team). This will enable the research design to be developed collaboratively, so that action research can be realistically implemented during the fieldwork stage.

The PhD candidate will work on their research design and related projects at the GMLCH between one and two days per week depending upon availability. The PhD candidate will receive an access

badge for the GMCA offices, hot desk working space (dependant upon availability), and monthly meetings with Mark Atherton (dependant upon his availability). This support represents a considerable in-kind contribution to the Realising Just Cities programme.

The PhD candidate will work on projects that support the GMLCH's initiatives under the supervision of Mark Atherton. These may include, but are not limited to council town hall events, pre-Green Summit events, the March 2018 Greater Manchester Green Summit, Green Summit Environmental Charter, a subsequent strategy, and more. The PhD candidate will work amongst GMLCH and GMCA staff. It is the responsibility of the PhD candidate, University of Sheffield and GMCA supervisors to ensure his workload at the GMLCH is of an appropriate level for the PhD candidate to successfully fulfil the requirements of a research design and upgrade.

Conduct

The PhD candidates will be subject to the GMLCH's rules governing conduct and behaviour of staff. The PhD candidate will observe the GMLCH's code of conduct for employees, equal opportunities policy, email and internet policies, financial regulations and any other policies notified to the PhD candidate.

The GMLCH will also respect the ethos and principles of the Realising Just Cities programme. This includes recognising and accurately representing the funders (Mistra Urban Futures and the University of Sheffield). This will be formally represented in relevant GMLCH Board documents and meetings. Press releases and communications about the project will be mutually agreed upon. GMLCH will collaborate to provide relevant information about the project, for instance, in Annual Reviews or impact statements.

Confidentiality and Research Ethics

All documents, information and communication throughout the duration of the PhD candidate's time in the GMLCH during this first phase of work will be held in confidence and shared only with the supervisory team. The PhD candidate is strictly prohibited from making public statements, either verbal or written, on behalf of the GMLCH unless the PhD candidate receives specific permission and consent.

Embeddedness and ethnography will enable substantive engagement in the collaborative design of the action research proposal, ensuring that the research design is realistic and achievable. The final research design will be subject to full ethical approval. In the meantime, this MoU is intended to ensure that initial research design work will also be undertaken to the highest ethical standards; the PhD candidate's notes that are taken and observations made during his time with the GMLCH will be shared with supervisors to support the research design. At the conclusion of Phase 1 (Research Design), and upon successful completion of the Upgrade, a meeting will take place between all parties to define what is in and out of scope as data to be carried forward for inclusion in the thesis.

Duration

This MOU shall become effective upon signature by the partner officials and will remain in effect until 1 July 2018 after which point a new MoU shall be established to dictate the terms of the relationships between the University of Sheffield, GMCA's GMLCH and Ryan Bellinson, PhD candidate.

Contact Information

University of Sheffield/Urban Institute
Beth Perry
Professor

Greater Manchester Environment Team

Mark Atherton
Assistant Director Environment

University of Sheffield
Ryan Bellinson
PhD Candidate, Urban Studies and Planning

Date:
(Beth Perry, University of Sheffield/Urban Institute, Professor)

Date:
(Mark Atherton, Greater Manchester Environment Team, Assistant Director Environment)

Date:
(Ryan Bellinson, University of Sheffield, PhD candidate)

Annex 7: Memorandum of Understanding 2

Harnessing Community Engagement for Climate & Environment Policy Development in Greater Manchester: Towards Coproduction

Memorandum of Understanding

Between the University of Sheffield, the Greater Manchester Low Carbon Hub and Ryan Bellinson

This Memorandum of Understanding (MoU) sets terms and understanding between the Urban Institute, University of Sheffield and the Greater Manchester Combined Authority's (GMCA) Greater Manchester Low Carbon Hub (GMLCH) for the role, workload and responsibilities of Ryan Bellinson (PhD candidate, *Realising Just Cities*).

Background

To further build upon the previous work between researchers at the University of Sheffield's Urban Institute and decision-makers within the GMLCH as part of the *Realising Just Cities* program, Mistra Urban Futures and the University of Sheffield have provided funding to develop a PhD cluster to determine the value of co-production between research and practice. One of the PhD candidates within the cluster will specifically focus on improving city-regional communication and engagement with civil society groups and citizens, with an emphasis on climate change and environmental governance within Greater Manchester. This investment is worth over £60,000 (including fees and bursary).

The recently elected city-region mayor, Andy Burnham, has called for the scoping and eventual implementation of a new landmark climate and environmental change policy for Greater Manchester. Under the mayor's instruction, the GMLCH will spearhead the city-regional government's effort towards developing this policy. This PhD candidate, under the umbrella of the University of Sheffield's Urban Institute and Realising Just Cities program, will work with the GMLCH to help explore and develop the communicative spaces between public policy officials and civil society in the city-region that will be used in the policy development process.

This PhD candidate is a development that further codifies the established relationship between the University of Sheffield and the GMLCH. The PhD candidate will participate in this project through an embedded action research study. For the PhD to have success working across the institutional boundaries of the University of Sheffield and the GMLCH, it is important for these two organisations to define clear parameters and guidelines to direct the PhD's role, workload and responsibilities.

Purpose

From July 2018 through December 2019, the PhD candidate's main responsibility is to collect data that can answer research questions put forth in the PhD's Confirmation Review. This data will be analysed and written into a PhD dissertation to fulfil the University of Sheffield's *Department of Urban Studies & Planning* PhD requirements. The 18-month period this MoU covers builds from a successful preliminary eight-month embedded

fieldwork period that cultivated initial data, created traction and built legitimacy ahead the University of Sheffield's Confirmation process.

The PhD will have four primary tasks while conducting embedded action research at the GMLCH. These tasks include:

- Supporting the engagement of experts in the policy development process
- Supporting the engagement of non-expert stakeholders
- Supporting communication and interface with digital engagement tools
- Developing an understanding of the broad climate and environmental governance network as it is currently constructed and support efforts to widen the network

To complete these tasks, the PhD candidate will be given an access badge for the GMCA offices, hot desk working space (dependant upon availability), and monthly meetings with Mark Atherton (dependant upon his availability). This support additionally represents a considerable in-kind contribution to the Realising Just Cities programme from the GMLCH.

The PhD candidate will support the GMLCH's initiatives under the supervision of Mark Atherton. These may include, but are not limited to facilitating discussion between expert working groups on digital communication tools, aiding possible expansion of expert working groups, maintaining On The Platform and facilitating discussions, supporting organising efforts of the March 2019 Greater Manchester Green Summit, assisting the development of an Environmental Charter, supporting the development of potential subsequent strategy, supporting to the widening of inclusive policy development practices and more (see Appendix 1). The PhD candidate will work amongst GMLCH and GMCA staff. It is the responsibility of the PhD candidate, University of Sheffield and GMCA supervisors to ensure his workload at the GMLCH is of an appropriate level for the PhD candidate to successfully fulfil the requirements of the data collection stage of this research.

Conduct

The PhD candidates will be subject to the GMLCH's rules governing conduct and behaviour of staff. The PhD candidate will observe the GMLCH's code of conduct for employees, equal opportunities policy, email and internet policies, financial regulations and any other policies notified to the PhD candidate.

The GMLCH will also respect the ethos and principles of the Realising Just Cities programme. This includes recognising and accurately representing the funders (Mistra Urban Futures and the University of Sheffield). This will be formally represented in relevant GMLCH Board documents and meetings. Press releases and communications about the project will be mutually agreed upon. GMLCH will collaborate to provide relevant information about the project, for instance, in Annual Reviews or impact statements.

Confidentiality and Research Ethics

All of the raw data including documents, emails, communication, field notes and other information will be held in confidence throughout the duration of the PhD candidate's time with the GMLCH. Publications will anonymise data as best as possible. Prior to embarking on this stage of the research, the PhD candidate will obtain University of Sheffield ethical approval to ensure this research maintain the highest possible ethical standard. The PhD candidate is

strictly prohibited from making public statements, either verbal or written, on behalf of the GMLCH unless the PhD candidate receives specific permission and consent.

Duration

This MOU shall become effective upon signature by the partner officials and will remain in effect until 31 December 2019 after which point the embedded action research phase of the PhD's study will conclude. The PhD may remain involved with the GMLCH subject to negotiation between the signatories of this MoU. If the PhD remains actively involved after 31 December 2019, a new MoU shall be established to dictate the terms of the relationships between the University of Sheffield, GMCA's GMLCH and Ryan Bellinson, PhD candidate.

Contact Information

University of Sheffield/Urban Institute
Beth Perry
Professor

Greater Manchester Environment Team
Mark Atherton
Assistant Director Environment

University of Sheffield
Ryan Bellinson
PhD Candidate, Urban Studies and Planning

Date:
(Beth Perry, University of Sheffield/Urban Institute, Professor)

Date:
(Mark Atherton, Greater Manchester Environment Team, Assistant Director Environment)

Date:
(Ryan Bellinson, University of Sheffield, PhD candidate)