Deliverable Proof – Reports resulting from the finalisation of a project task, work package, project stage, project as a whole – EIT-BP2020

Name of KIC project the report results from that contributed to/ resulted in the deliverable	Practice-based Learning in Cities for Climate Action
Name of report	A. Stakeholder challenges internal report
Summary/brief description of report	Report to share with internal PELICAN stakeholders at GMCA, and with close city-region partners, to indicate the needs and challenges of city problem-holders in planning innovation approaches to green transition needs.
Date of report	10/12/20

Supporting documents: attach in pdf format

Institute for Innovation and Public Purpose

Stakeholder challenges:

Governing missions at local and regional level

A report prepared for EIT Climate-KIC by IIPP

Institute for Innovation and Public Purpose

At IIPP, our aim is to change how public value is imagined, practiced and evaluated. Today's challenges – from tackling climate change to building resilient health systems – cannot be resolved by one organisation or sector alone. Finding solutions requires new collaborations across the state, businesses and civil society – collaborations that can innovate and shape markets, fostering both public value and economic growth.

We believe that the creation of public value must be carefully directed and co-designed. And so, more than a traditional academic institution, we get our hands dirty, working with green transition practitioners and public sector bodies to help identify and develop the tools, maps, metrics and capabilities needed to address global challenges and secure inclusive growth.

Our work with Greater Manchester Combined Authority over the past two years, and with EIT Climate-KIC in the PELICAN project, has been to take on practice-based learning about the role of public value and public purpose, and of market-shaping and market co-creating, to address the climate crisis in cities and city-regions. In Greater Manchester this has been explored through the mechanism of mission-oriented innovation, which the city-region took up in 2019.

This report was written during the 2020 COVID19 crisis. As such, the report reflects ongoing discussion around GMCA's COVID-19 'Build Back Better' plan, and the wider economic and social implications of the pandemic.

IIPP also took part in GM's Independent Prosperity Review panel at the time of the COVID-19 crisis, and provided input and evidence that may be reflected in this report. There are also mentions of learnings from, and learnings for, other cities and city-regions facing the same challenges.

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Welcome to the report

The aim of this report is to better understand the governance arrangements, and stakeholder engagement activities, of cities that are taking a mission-oriented approach to clean growth and the climate crisis. It does so by exploring the experience of Greater Manchester Combined Authority (GMCA), which is working towards a mission of 'Carbon neutral living within the Greater Manchester economy by 2038,' adopted by the city-region in 2019[1] with the design and research support of IIPP.

The report takes on two analytical lenses: internal governance (the organisation structures, reporting and tracking that GMCA has established) and external governance (how GMCA has engaged with the range of stakeholders and partners in the mission). In fact, as discussed in detail below, GMCA has blended the two.

This report lays out the governance arrangements that GMCA has established, and reflections on its strengths and challenges in pursuing a mission-oriented innovation approach to clean growth, in answer to the following research questions:

1. How has Greater Manchester Combined Authority governance had to change to take on missions?

2. How has Greater Manchester Combined Authority engaged stakeholders in the mission?

How to read this report

This report is one of six developed as part of the Practice-based Learning in Cities for Climate Action (PELICAN[2]) project at IIPP in 2020. The PELICAN project focusses on the city systems across the world that are on the frontline of climate change and city problem-owners who occupy a pivotal role in the green transition. There is an innovation gap which currently inhibits cities' conceptualisation around clean growth and required systems change, which requires deep exploration and new economic approaches.

In PELICAN's project proposal, we believed a report exploring the stakeholders and institutions involved in implementing Greater Manchester's mission would be necessary. As the project developed, this has evolved into broader structural questions focused on the mission's governance.

In particular, the PELICAN project enables IIPP to work closely with the city-region of Greater Manchester to demonstrate, at city level, the mission -innovation (MOI) approach to clean growth developed by IIPP. The institute worked closely with Greater Manchester Combined Authority between 2018 and 2020 to develop a mission-oriented roadmap.

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[1] Greater Manchester. (2019). *5 Year Environment Plan for Greater Manchester*. Available at: https://www.greatermanchester-ca.gov.uk/media/1986/5-year-plan-branded_3.pdf.
[2] See: https://www.ucl.ac.uk/bartlett/public-purpose/research/projects/pelican.

Executive summary

This report shows that Greater Manchester Combined Authority (GMCA) is well-placed to provide experimental, dynamic and supportive mission-oriented governance, but that it is not yet harnessing its full governance and convening capabilities effectively.

An audit of governance levers and capabilities would support the city-region to better understand and organise its governance systems as it moves into the second year of the mission-oriented approach.

Developing from a full governance audit, we recommend that actions be taken in six key areas:

1. **Encourage the ability to learn from failures, and equip teams to be visionary and flexible.** Innovation does not occur in a vacuum – it is dependent on cumulative and collective work undertaken by multiple institutions, systems and actors. Public sector institutions, including DARPA and ARPA-E, have successfully led mission-oriented innovation by setting challenges and taking deliberate approaches to deliver innovation. These institutions governed missions by enacting structures to support a visionary focus on impact; empowering teams through flat hierarchies; providing long-term funding; evaluating teams against project milestones; and focusing on implementation. GMCA could learn from these examples and take a more deliberate approach to supporting the innovation ecosystem within its own organisation.

2. **Create space and expectations of governance innovation across organisational, social and cultural domains.** Achieving GMCA's mission is dependent on strong collaboration with external actors and institutions, which emphasises multiple bottom-up solutions and a 'hub and spoke' model characterised by a tight core group, linked to an open and networked wider set. This model must be flexible and open to experimentation and testing. Different groups must be allowed and encouraged to trial different governance models, and share findings with the wider teams.

3. **The governance system will need to navigate and support directed innovation, which requires working with uncertainty and complexity.** The Challenge Groups (CGs) that were established to govern GMCA's mission are strongly aligned with mission-oriented innovation theory in their cross-sectoral, multi-disciplinary structure. The CGs have been successful in forming new partnerships, and it is evident that synergies and crossovers that have developed through this year-long process would not have been created without the CG structure. It will be important to capitalise on this momentum from 2021 onwards, ensuring that the activities developed in the CGs to support the mission provide genuine additionality and accelerate the pace of the green transformation.

4. **The governance structure will need to help build a wider movement that supports delivering the mission.** This will demand more diverse CG memberships and deeper forms of citizen engagement. The CG will need to facilitate distributed ownership of the mission across actors and organisations throughout Greater Manchester. This will require cultural

changes around who is responsible for different aspects of the mission and new operational practices that can enable the empowerment of actors formally engaged in the mission, through CGs and other governance bodies, to find solutions to barriers, and to try them independently from GMCA.

5. **New forms of performance metrics will be needed to track progress.** The current indicators are not well-suited to monitoring dynamic efficiency approaches and long-term mission thinking. The existing quantitative KPIs should be augmented with qualitative, sense-making approaches to monitoring progress. In addition, a more systematic approach to learning within the CGs, which can increase understanding and knowledge in addition to achieving targets, should be established. This dynamic approach of utilising monitoring indicators that are aligned with mission-oriented innovation theory could also support engagement with wider audiences and movement-building initiatives.

6. **Reorient the governance vehicles to be a forum for dynamic, exciting joint problem-solving rather than 'programmatic' vehicles.** The role of the CGs has become narrower over time and leans towards being characterised by linear delivery rather than circular, iterative innovation. For the 'innovation' gap' to be met, the mission needs to facilitate non-linear carbon reductions that will only be achieved through learning and innovation supported by robust feedback loops, enabling tipping points to be reached.

Learnings for other cities and regions

The experience of GMCA in setting up its mission-oriented approach to clean growth has lessons that can support other cities and regions seeking to do similar work.

Specifically, we believe this work has shown:

1. There is an urgent need to develop an evaluation/target framework that prioritises innovation and discovery as much as implementation.

2. Cities need support with mainstreaming and scaling innovation to make it 'business as usual' across the relevant segments of the city-system.

3. Engaging citizens in decision-making and implementation is perceived as risky and may slow down the process. Cities may better utilise public engagement tools if there was greater understanding of how empowered citizens could accelerate the process.

4. Cities are not able to deliver the clean growth transition on their own. Building a culture of independence between robust partnerships may enable faster progress.

A short introduction: Mission-oriented innovation

Mission-oriented innovation and city applications

Mission-oriented innovation is a new approach to innovation. It encourages government to take on a market-shaping role, rather than a market-fixing one, and acts to direct the market by transforming the focus of investment towards societal 'grand challenges', from the climate crisis to healthy ageing. In taking on a challenge, a long-term, politically resilient 'mission' is framed, which must be concrete, time-bound, ambitious, bottom-up and cross-sectoral[3]. Missions set out a new investible universe, through ambitious, high-profile, long-term directions of travel.

Greater Manchester has taken up a mission-oriented approach to its aim of becoming a carbon-neutral city-region by 2038. This mission, and the activities developed to support it, were kick-started by a research collaboration with IIPP in 2018, which generated the hypothetical mission roadmap below. Over the course of this project, we have observed the first year of mission-oriented innovation implementation in this city-region and aim to draw lessons from this experience, both for Greater Manchester and for cities taking up missions across the world.

Figure 1: Mission roadmap for Greater Manchester: Carbon neutral city by 2038
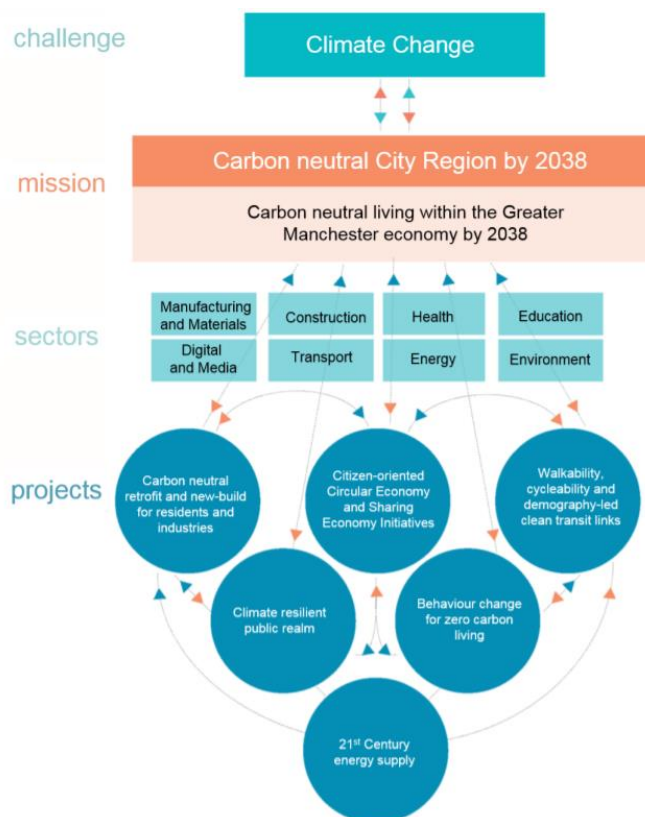
*Source: IIPP's technical report for the GMCA Independent Prosperity Review, 2018*

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[3] Mazzucato, M. and Dibb, G. (2019). *Missions: A Beginner's Guide*. Available at: https://www.ucl.ac.uk/bartlett/public-purpose/sites/public-purpose/files/iipp_policy_brief_09_missions_a_beginners_guide.pdf.

Scale of the mission

Greater Manchester's clean growth mission has set a bold ambition for the city-region as a whole. Responding to climate change requires coordinated action across the world. The 2015 Paris Agreement has the goal of keeping the global temperature rise this century well below a 2^0C increase above pre-industrial levels, with the ambition to limit the temperature increase to 1.5^0C[4]. The University of Manchester's Tyndall Centre for Climate Change Research calculated a carbon budget for Greater Manchester that is compatible with the UK Government's contribution to the Paris Agreement[5]. This research demonstrated that for Greater Manchester to make its 'fair' contribution towards the commitment, carbon neutrality would need to be achieved by 2038 through immediate emissions cuts of 15% per annum.

Alongside the carbon budget, GMCA commissioned research to understand potential carbon reduction pathways for Greater Manchester. The Setting City Area Targets and Trajectories for Emissions Reduction model (SCATTER) provided emission reduction pathways related to local decisions taken across over 40 different interventions, which can be implemented via four scenarios. The graph below sets out potential carbon reduction pathways for Greater Manchester, against the carbon budget recommended by the Tyndall Centre's research.

Figure 2: Potential carbon reduction pathways for Greater Manchester
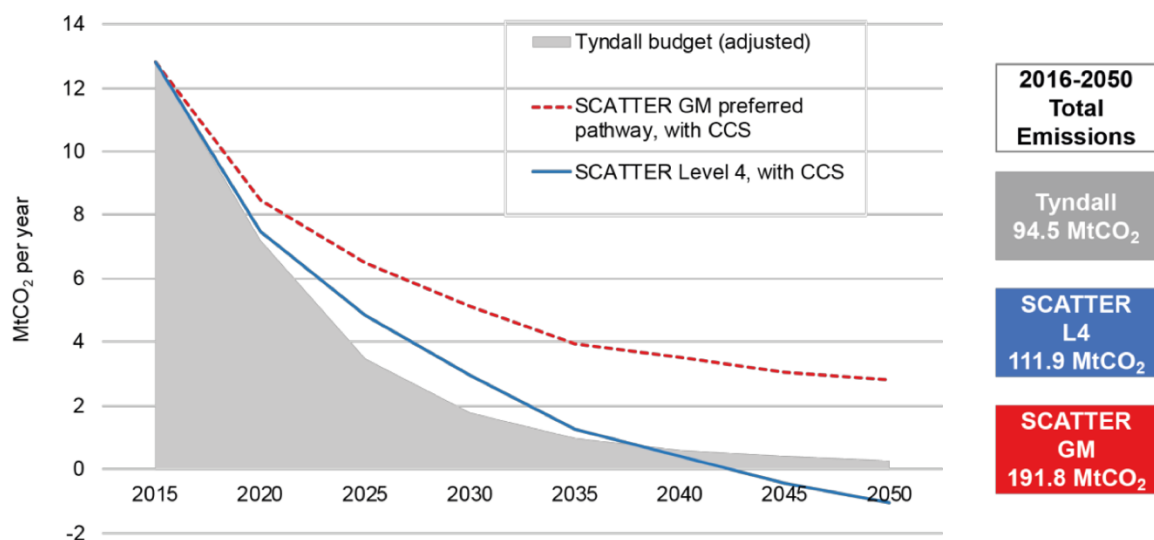
Source: Anthesis

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[4] United Nations. (2015). Paris Agreement. Available at: https://unfccc.int/files/essential_background/convention/application/pdf/english_paris_agreement.pdf.

[5] Kuriakose, J., Anderson, K., Broderick, J., and Mclachlan, C. (2018). *Quantifying the implications of the Paris Agreement for Greater Manchester*. Available at: https://www.research.manchester.ac.uk/portal/files/83000155/Tyndall_Quantifying_Paris_for_Manchester_Report_FINAL_PUBLISHED_rev1.pdf.

As seen under the 'SCATTER Level 4' pathway above, the most ambitious scenario, it is possible to achieve carbon neutrality, but by nearly 20% above the Tyndall Centre's recommended budget by 2050. To achieve the scale and pace of change set out in Greater Manchester's mission, innovation is required across technological, governance and societal spheres.

Mission-oriented institutions and governance

Innovation does not happen in a vacuum – it is dependent on institutions, actors and systems[6,7]. Traditionally, many government innovation agencies have focused on early-stage research and development (R&D), eschewing focus on the full innovation chain, from basic research to full deployment, and therefore on the actions needed to embed that innovation in the market[8]. The 'valley of death' (the gap between research and implementation) is a familiar problem. Indeed, when discussing innovation investment, the Greater Manchester (GM) Local Industrial Strategy recognises that, 'There are gaps in the commercialisation eco-system[9].'

One particularly successful structural model IIPP has analysed is that used by institutions such as the Defence Advanced Research Projects Agency (DARPA) and Advanced Research Projects Agency – Environment (ARPA-E) in the United States. These institutions have – consciously or not – taken up a mission-oriented innovation approach, setting challenges and looking for revolutionary technological breakthroughs to achieve them. In doing so, these institutions were structured to support mission-oriented innovation in their daily practices and processes, and subsequently developed long-term governance approaches to facilitate and distribute responsibility to manage this dynamic form of working. This approach led to many of the critical technological breakthroughs of the 20th century, including the internet, GPS, Siri and many more. As Bonvillian (2018) notes, when ARPA-E was set up in 2009, the team consciously took on many of the successful organisational features of DARPA. It is worth taking the time to review some of these aspects in greater detail, to understand how the organisation of these institutes brought the research power of the United States to bear on their most critical challenges:

Visionary focus
Programme managers would imagine the breakthrough technologies they needed in a process called 'technological visioning', and then considered the research proposals that might support that journey. They focused on impact, not risk, and both accepted and expected failure, as long as the

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[6] Bonvillian, W. (2018). DAPRA and its ARPA-E and IARPA clones. *Industrial and Corporate Change*, 27(5), pp. 897-914. Available at: https://www.researchgate.net/publication/329761013_DARPA_and_its_ARPA-E_and_IARPA_clones_a_unique_innovation_organization_model
[7] Nelson, R. (ed.). (1993). *National Systems of Innovation*. New York, NY: Oxford University Press, pp. 3–21, 505–523.
[8] Mazzucato, M. and McPherson, M. (2019). *What the green revolution can learn from the IT revolution*. Available at: https://www.ucl.ac.uk/bartlett/public-purpose/publications/2019/aug/what-green-revolution-can-learn-it-revolution.
[9] GMCA. (2019). *Greater Manchester Local Industrial Strategy*. Available at: https://www.greatermanchester-ca.gov.uk/media/2132/gm-local-industrial-strategy-web.pdf.

potential payoff of a project was high. This was arguably the most important aspect of their institutional design, giving them the freedom to work on and fund projects that would have be very unlikely to be developed otherwise.

Empowered teams
The DARPA team was small – 100 programme managers – with a flat hierarchy and empowered, talented staff. They served for a time-limited period (normally three to five years) to ensure a constant inflow of new ideas. The organisation had an 'island and bridge' model – it was cut off from the day-to-day bureaucracy of government and operated under different rules (for example, in the way that it was able to hire people or contract with organisations), but with strong links back to senior decision-makers who supported its work and pushed for its discoveries to be implemented.

Funding and evaluation of projects
DARPA provided both short-term seed funding for the early stages of research projects, but also longer-term funding to support organisations to scale up. In particular, it leveraged the procurement power of the Department of Defence to provide lead markets to new technologies, enabling them to reach a scale that made them commercially viable. However, it was not afraid to cut funding when a project was not delivering. Although it made use of project milestones, it did not set strict measures, or KPIs at the outset – rather, it 'actively managed' projects, redirecting them where it saw new or alternative opportunities for technological breakthroughs.

Mobilisation of private finance by public institutions
There is a history of private sectors labs stimulating a healthy tension between business and government. For example, the US telecommunication giant AT&T was required to reinvest a percentage of its profits into long-running radical innovation to retain its monopoly status[10]. To fulfil its obligation, AT&T created Bell Labs. Bell Labs was able to benefit from a long-term funding strategy that supported a 'willingness' to experiment towards a goal. Through a project sponsored in part by DARPA, Bell Labs used its patient finance model to develop much of the technology found in photovoltaic cells.

ARPA-E: Increased focus on implementation
ARPA-E, like its precursor, DARPA, is focused on finding and delivering breakthrough technologies. However, it operates in a very different context – the Department for Energy is not a large procurer of energy technologies, so deployment is ultimately driven by the private sector. There is additional support to overcome this barrier – from considering the 'tech stand up process' at the start of a project, to holding an annual summit bringing together politicians, VC funds and start-ups. There is a designated tech-to-market team that supports researchers in the

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[10] Mazzucato, M. and McPherson, M. (2019). *What the green revolution can learn from the IT revolution*. Available at: https://www.ucl.ac.uk/bartlett/public-purpose/publications/2019/aug/what-green-revolution-can-learn-it-revolution.

commercialisation process and coaches research teams through the 'stage gate' process typically used in industry to assess potential new innovations.

DARPA and ARPA-E are both clearly focused on technological innovations – whether 'hard tech' (i.e. physical things that require manufacturing) or 'soft tech' (digital software). While the success of the GMCA will absolutely depend on this kind of innovation, it will also require innovation more widely conceived, in both governance and society. This could be new financial instruments (such as investing in natural capital), democratic and participatory innovation, regulatory and policy innovation, and more. Although the domains of experimentation and missions are different, the features noted above will still be important in driving innovation to achieve the mission. These outlined capabilities – ability to learn from failure, visioning, smart and flexible teams, funding and active management – are all critical to build into GMCA's mission governance.

Project research approach

In this study we have:

1. Drawn on a range of GMCA policy documents, IIPP research and wider literature to explore the role of local government powers in making missions happen.

2. Attended a number of Challenge Group meetings, the fora in which different elements of the mission are discussed.

3. Run focus groups, a series of workshops and interviewed 10 key stakeholders. Quotes are used throughout the report, but not attributed to individuals.

4. Consulted with city transformation experts and mission-oriented approach practitioners, inside and outside the IIPP team.

While the research team were originally planning to be 'in residence' at GMCA, the COVID-19 restrictions have meant that the study has been completed virtually.

21st century collaborative mission governance

While the missions of the past were broadly dependent on technological developments for their success, GMCA's mission, as with all missions focused on 21st century 'wicked problems', such as the climate crisis, also requires organisational, social and cultural innovation[11]. It is important that strong relationships are built between government organisations with key external stakeholders to encourage their active involvement in the development of solutions, progress a lead market environment in which to scale innovations, and help build an inclusive movement across the city-region.

Collaboration comes in many forms. Missions have been described as 'visionary collaboration,' with an emphasis on promoting multiple bottom-up solutions and a 'hub and spoke' model characterised by a tight core group, linked to an open and networked wider set of actors[12]. Institutions can be categorised into three types: anchor, formal and informal, which are outlined below. The value of the categorisation is in supporting the development of a segmented stakeholder engagement strategy; partnerships with institutions of different types will need to be built in different ways and the means through which they are able to support the mission will also vary. When developing the initial mission roadmap (see accompanying Refined Mission Roadmap Report (report C)), IIPP studied the status and activity of different actor groups in the city-region's innovation landscape, to understand the potential for sector-level input and cross-sector interaction.

Anchor: The Centre for Local Economic Strategies focuses in particular on the role of anchor institutions in being pivotal change agents in their geographical area. Anchor institutions are large, locally rooted, often public sector organisations, such as local councils, the NHS, police, schools and universities, transport providers and housing associations, among others[13]. These organisations play multiple roles in the local economy (see accompanying Levers Report (report C)) – they have significant procurement budgets, large staff numbers and can set standards in a local market (for example, by targeting spending power to zero carbon suppliers or by providing EV charging points for staff cars).

Formal: Beyond anchor organisations, there are a range of formal institutions across a city-region. This could include business groups, retailers, unions, residents' associations, industry groups, community groups and environmental groups, among others. Although on their own these groups will typically have less market-shaping power compared than anchor institutions, they collectively

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[11] Greater Manchester Independent Prosperity Review. (2019). *A Mission Oriented Approach to Clean Growth*. Available at: https://www.greatermanchester-ca.gov.uk/media/1909/gmipr_tr_amissionorientedapproachtocleangrowth.pdf.
[12] Collaborate CIC. (2019). *Forms and features of collaboration*. Available at: http://wordpress.collaboratei.com/wp-content/uploads/Forms-and-features-of-collaborations.pdf.
[13] CLES (2017). *Community Wealth Building through Anchor Institutions*. Available at: https://cles.org.uk/wp-content/uploads/2017/02/Community-Wealth-Building-through-Anchor-Institutions_01_02_17.pdf.

constitute the majority of the economic life of the city-region and as such are critical to the success of the mission. They are mostly professional and the larger ones may have climate strategies of their own. As they are generally smaller that anchor institutions, a key question here may be how to aggregate activity to create the scale to shape and create markets – for example, enabling multiple commercial landlords in close proximity to jointly retrofit their properties.

Informal: Finally, there are multiple informal institutions that may enable city-regions to reach people and groups that they would otherwise struggle to engage. This could include looser 'green communities' (e.g. ramblers, birdwatchers' associations), parents and school communities, sports fan clubs and mutual aid groups that have appeared in response to COVID-19. These are more likely to be recreational or social than professional, but may be groups into which people invest more of their identity and cultural allegiances. Individuals are thought to have a high degree of trust and confidence in informal institutions, rending the actions and messages championed by these institutions particularly influential. Bringing them into the mission may therefore create a stronger bond with citizens in these groups, and help drive the behavioural and social change needed.

Mission governance in GM: By stakeholders, of stakeholders

When developing mission roadmaps, we aim to distinguish between 'sectors' and 'actors' – the former are the industrial and service groups carrying out the innovation activities, while the latter aim to steer and guide. In the governance of the GM mission, the two come closer together, to the point of indivisibility. GMCA, in facilitating the clean growth mission, has brought together influential actors from different strategic sectors to stimulate and direct innovation. It may be difficult to distinctly separate sectors and actors when facilitating climate missions, as GMCA has shown. The five Challenge Groups, which have been designed as the main governance structure for the mission, are comprised primarily of external stakeholders, with GMCA support. As detailed below, one of the primary aims for GMCA is to establish 'distributed ownership' of the mission, and to encourage and enable the organisations it is working with to drive the mission forward.

This section describes the overarching system of Challenge Groups, explains which institutions and stakeholders are included, and how progress is tracked. The subsequent section then reflects on the successes and the challenges facing the Challenge Groups as the mission moves into its second year.

The GMCA Challenge Groups

GMCA has established a programme and activity governance structure based around five Challenge Groups (CGs), each relating to different aspects of the mission[14]. These are roughly aligned with the 'mission project' element of the initial mission roadmap. The organogram below (see Figure 3) illustrates this.

The Challenge Groups are:
- Low Carbon Buildings
- Energy Innovation
- Sustainable Consumption and Production
- Natural Capital
- Communication and Behaviour Change.

Membership of the groups is primarily a combination of GMCA and local authority (LA) employees, academics, business and several NGOs and charities (membership is discussed in more detail below). Each CG meet quarterly and CG chairs are charged to 'liaise with GMCA employees to stay up to date, plan and structure the work, and act as a sounding board to GMCA.' The CGs themselves sit within the broader governance framework of the Green City Region Partnership –

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[14] See CGs content in the **Refined Mission Roadmap report** which also comments on the status and make-up of the CGs, and explores more deeply the role of mission projects and task and finish groups.

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the 'region's leading businesses, community and voluntary, third sector and charity organisations, green influencers, schools and individuals' that created the 5 Year Environment Plan Forum[15]. The Green City Region Partnership provides oversight of the work taking place within the CGs and is the primary channel for elected officials to be involved in the mission. The CGs also receive scrutiny, advice and informal support from the 5 Year Environment Plan Forum, which comments on the activities of the CGs and helps identify potential opportunities to link the work of individual CGs to relevant activities taking place in the city-region.

Within each CG are a number of 'task and finish' groups, responsible for the delivery of initiatives within the CG. As shown in Figure 3 below, the task and finish groups may be relevant to more than one CG – for example, the Local Energy Market Task and Finish group impacts the work of both the Low Carbon CG and the Energy CG. Task and finish groups are intended to have a finite duration and concentrate activity to support an acute objective, adjourning once that defined objective has been met. Each task and finish group is constituted of CG members, some with representation from more than one CG, and they are accountable to the CGs for delivering their aims.

Figure 3: Mission governance – GMCA organogram
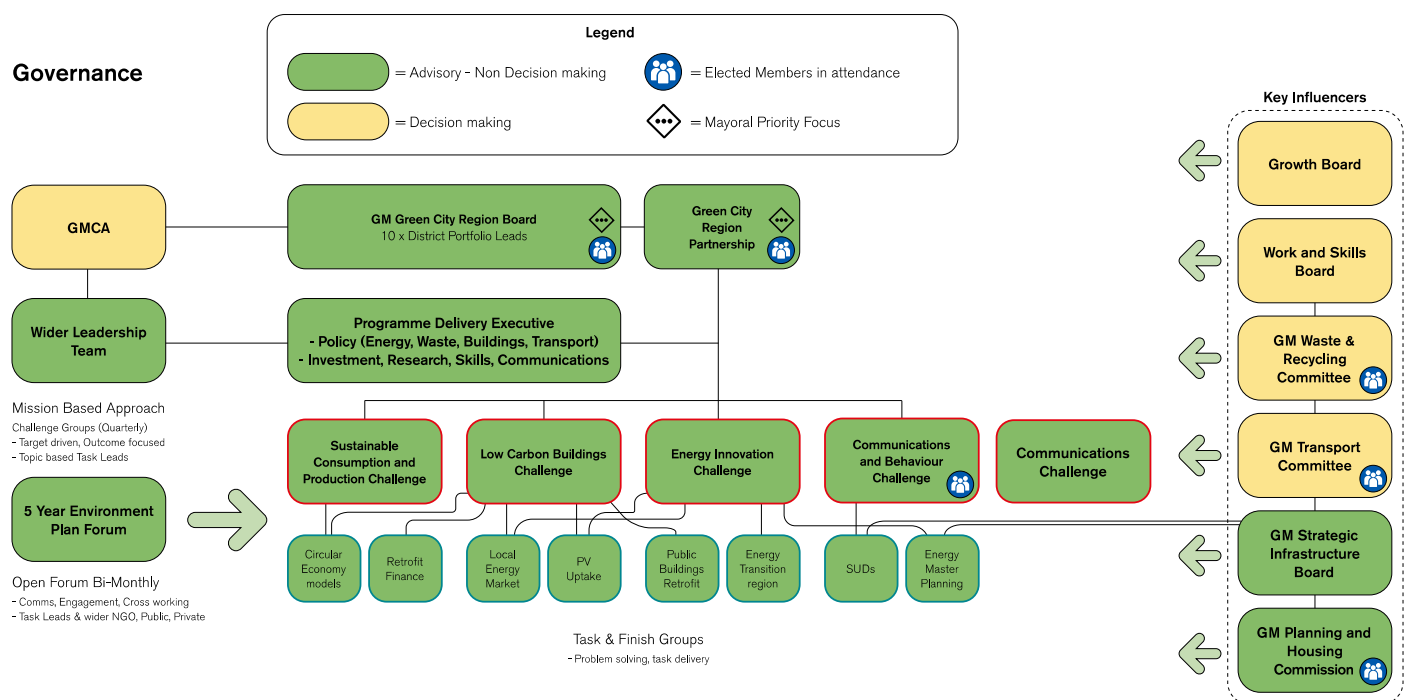
Source: Adapted from GMCA

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[15] GM Green City. (2020). Available at: http://gmgreencity.com/.

Creation of the Challenge Groups

As pointed out by several interviewees, GMCA has a long history of collaboration with other organisations. The networks that already existed formed the basis of the Challenge Groups. For example, GMCA had previously hosted thematic 'workstreams' focused on areas such energy, building, and sustainable consumption and production. These workstreams brought together individuals from across the city-region who represented industry and academia to develop some of the proposals that were brought forward in the 5 Year Environment Plan[16]. The membership of these workstreams was the starting point that formed the Energy CG. Members were then asked to reach out into their networks, growing the group in an organic way and forming a 'coalition of the willing,' as one interviewee put it.

CG members were motivated to sign up and participate for a multitude of reasons. The mission itself is something they support and is in line with work that many of them are doing within their own organisations. But, as one interviewee put it, 'We are learning what is required for the net zero pathway through this approach. This will help us develop our business planning.' In other words, there is a commercial rationale that supports purpose-driven behaviour. Two considerations in particular seemed important: first, involvement in the mission supports business planning by giving those organisations greater insight into the direction of travel (as well as some ability to shape it). Second, the CGs are a good forum in which to promote relevant work that may be strengthened by partnering with other organisations in the group.
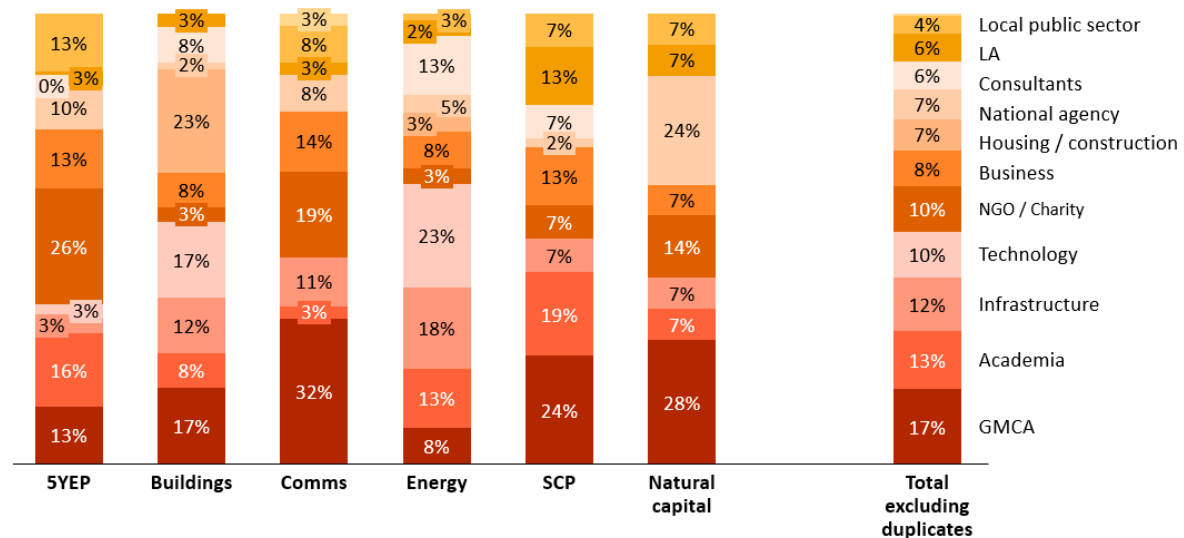
Challenge Group membership

Based on analysis of data provided by GMCA, the Challenge Groups and the 5 Year Environment Plan Forum have 227 members in total (excluding duplicates – there are some individuals who are members of more than one group – see Appendix 3 for further details). They have been categorised into 10 organisation types. Overall, GMCA employees make up the largest share of the CG members (17%), but there is significant variation within the groups. In three of the groups – Communication and Behaviour Change, Sustainable Consumption and Production, and Natural Capital – GMCA employees form the largest proportion, with between a third and a quarter of the members. However, in the other two Challenge Groups, plus the 5 Year Environment Plan Forum, other backgrounds are dominant.

Other well represented groups include academia (14% overall) and infrastructure (12% overall – this includes organisations such as United Utilities, Electricity North West and Cadent). Less well represented groups include people and organisations from the local public sector or the constituent local authorities, although, again, there is variation within groups. There is also a wide set of stakeholders not represented at all. The next section, on expanding the membership, considers who else GMCA might want to bring in to support the mission.

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[16] Greater Manchester. (2019). *5 Year Environment Plan for Greater Manchester*. Available at: https://www.greatermanchester-ca.gov.uk/media/1986/5-year-plan-branded_3.pdf.

Figure 4: Challenge Group membership by organisation type, %

	Colour key
	Local public sector
	LA
	Consultants
	National agency
	Housing / construction
	Business
	NGO / Charity
	Technology
	Infrastructure
	Academia
	GMCA

Source: IIPP analysis of data supplied by GMCA

Leuven, in Belgium, provides an interesting point of comparison for the framework GMCA has developed for its mission. In 2013, it established the non-profit organisation Leuven 2030, responsible for its roadmap to climate neutrality by 2030. There were initially 60 organisations involved, including residents, banks, urban designers, architects, universities, environmental groups, energy companies and others. The group is now significantly larger – over 500 members – and is open to anyone to join. There are a range of different membership types, with different rates and benefits, as shown in the table below.

Figure 5. Leuven 2030 membership typology

Membership	Price / year	Benefits (summarised)
Citizen	€15	Events, newsletter, networking
Civil society organisations	€15	As above
Company, university, government	**€500**	As above + brand affiliation, carbon measurement
Basic partners	**€5,000**	As above + 'intake interview'
Premium partners	€10,000	As above + article on Leuven 2030 website, opportunity to present to other partners
Silver partners	€25,000	As above + additional custom benefits
Gold partners	€100,000	As above + additional custom benefits

Source: Leuven 2030

As well as being a membership organisation, Leuven 2030 has a project team working on implementation. That team includes a coordinator, participation officer, process manager, communications officers and project officers, most of whom are employed directly by Leuven 2030[17].

Closer to home, the Manchester Climate Change Agency (MCCA) and Manchester Climate Change Partnership (MCCP) provide a further example for comparison. In 2015, the MCCA was established by Manchester City Council as an independent Community Interest Company to drive forward citywide action on climate. Subsequently, the MCCP was established in 2018 to bring together organisations from across the city representing the public sector, private sector, third sector, academia and community groups to support climate policy development, and to raise awareness and promote actions across their networks[18].

The MCCA and MCCP produced the Manchester Climate Change Framework 2020-2025 with the intention to direct action that would leverage the MCCP's 60 members from 10 sectors, which are responsible for over 20% of Manchester's direct CO_2 emissions, and have a reach into the

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[17] Leuven 2030. (2020). Available at: https://www.leuven2030.be/over-ons.
[18] Manchester Climate Change Partnership. (2017). Available at: https://www.manchesterclimate.com/mccp/terms-of-reference.

remaining 80% through the organisations' staff, students, tenants, customers, football fans, worshippers, theatregoers and others[19].

Figure 6. MCCA relationship with key governance bodies[20]
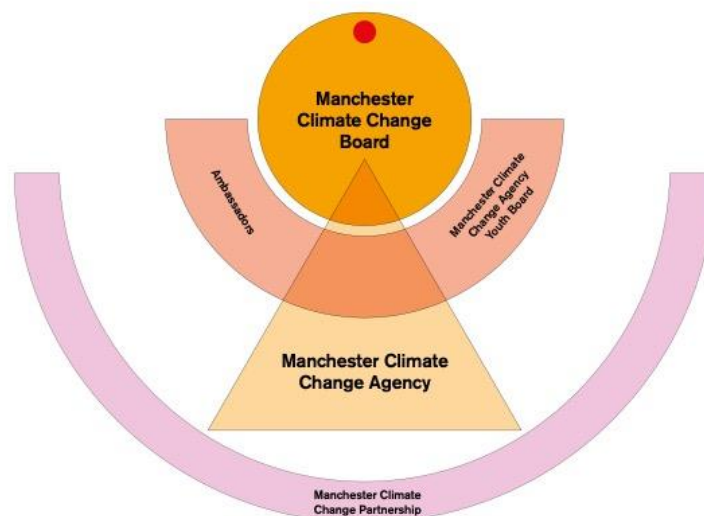
Source: Adapted from MCCA

Tracking progress

The 5 Year Environment Plan has 21 key priorities, against which GMCA is tracking or planning to track 28 measures. The data quality in the latest tracker (see Appendix 1) falls into one of three buckets. The first contains priorities that are well defined, with benchmark data to show the progress that has been made – for example, 'additional renewable capacity (Mw),' 'number of trees planted' and 'increase number of ultra-rapid charging points.' The second is defined, but data is not yet available – most measures fall into this bucket. Finally, some priorities do not yet have any clear measures defined against them, such as 'reduce unnecessary food waste.'

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[19] Manchester Climate Change Agency (2020). *Manchester Climate Change Framework 2020-25*. Available at: https://www.manchesterclimate.com/sites/default/files/Manchester%20Climate%20Change%20Framework%202020-25.pdf.
[20] Manchester Climate Change Agency (2020). *Manchester Climate Change Framework 2020-25*. Available at: https://www.manchesterclimate.com/sites/default/files/Manchester%20Climate%20Change%20Framework%202020-25.pdf.

There is also a RAG rating to indicate whether a priority is on track – only two out of 21 are labelled red, with 10 amber and the final nine all green. It is unclear exactly how these ratings are arrived at, especially those which are given to priorities without a confirmed measure (e.g. 'reduce the head demand in new buildings') or without data (e.g. 'uplift in urban green infrastructure').

The RAG rating that has been put into place is notable for its ability to support the clean growth mission and encourage an environment of innovation between GMCA and its partners through the CGs. As explored above, the learning from DARPA and ARPA-E demonstrates that mission-oriented institutions benefit from tracking and evaluating projects against robust frameworks that are open to feedback, non-linearity and tipping points. These dynamic approaches to tracking progress can more effectively evaluate missions than conventional KPI' or cost-benefit analyses, because they can monitor development throughout the entire innovation chain rather than statically measure end-of-system outputs.

Full reflections and recommendations

Reflections

The CGs are strongly aligned with mission-oriented innovation theory in their cross-sectoral, multi-disciplinary structure. Multiple interviewees agreed that one of the clearest successes in the mission so far has been the ability to bring together a diverse group of stakeholders and build commitment to the mission. While the CGs have often built on previous collaborative deliberative forums, one interviewee who has a long history of working with GMCA said that, 'this is probably the most structured I've ever seen the collaboration… What they've done very successfully is got people to do things on a voluntary basis.'

The CGs also appear to have been successful as a tool for engaging those organisations that GMCA will rely on to deliver the mission, expanding their capacity and providing the energy to drive the programme forward.

We believe the CGs face three key challenges in the year ahead:

1) The challenge of directed innovation

At the heart of the mission-oriented approach is a form of innovation that is directed at arguably society's most pressing challenge – the climate crisis[21]. As noted above, we mean innovation in its broadest sense; not just in R&D programmes and scientific laboratories, but the mix of technological, regulatory, policy-based, social, financial, services and cultural innovation. This does not come from scientists or entrepreneurs, but from the whole city-region. GMCA recognises that simply rolling out and scaling up its current projects and initiatives is unlikely to meet the scale of the ambition set. It is worth noting that even if the massive reduction in activity that we have seen as a result of the COVID-19 lockdown were to continue at the same level over the coming 18 years, the reduction of CO_2 would not be enough to bring GM into line with its 2038 target.

2) The challenge of building a movement

The CGs are made up of a mix of people and organisations. While this has enabled GMCA to do more than it could on its own, the membership is still for the most part limited to people with experience and expertise in those sectoral domains, and it is not clear that this collation of members is in itself enabling the kind of cross-sectoral movement that is needed for the

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[21] Mazzucato, M. (2017). *Mission-Oriented Innovation Policy: Challenges and Opportunities*. Available at: https://www.ucl.ac.uk/bartlett/public-purpose/sites/public-purpose/files/moip-challenges-and-opportunities-working-paper-2017-1.pdf.

mission[22]. A sense of 'movement' and 'mission mystique' has not yet evolved, despite the strong political will behind the mission.

3) The challenge of distributed ownership

One of the priorities from GMCA's perspective is to create a mission culture in which members of the Challenge Groups are able to take ownership of the work and drive the agenda. As one interviewee put it, 'We want to change the expectation of "it's our job" to "it's everyone's job."' There is strong recognition here that GMCA can't achieve the mission on its own, or even with others as only supporting actors. However, according to one interviewee there is currently, 'Still a big expectation across the stakeholders that they will be led through the process – that GMCA will determine the agenda, coordinate and organise things, have thought things through.'

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[22] Mazzucato, M. and McPherson, M. (2018). *The Green New Deal: A Bold Mission Oriented Approach*. Available at: https://www.ucl.ac.uk/bartlett/public-purpose/sites/public-purpose/files/iipp-pb-04-the-green-new-deal-17-12-2018_0.pdf.

Recommendations

Recommendation 1: Encourage the ability to learn from failures, and equip teams to be visionary and flexible.

Unlike with 'complicated' problems, the inherent uncertainty in responses to complex situations means there is limited value in extensive analysis before acting. Rather, leadership needs to adopt a 'probe, sense, respond' approach that emphasises experimentation; be flexible and adaptive; and make time to engage in collective reflective practice[23]. As Snowden and Boone say, '[In complex environments] we can understand why things happen only in retrospect. Instructive patterns, however, can emerge if the leader conducts experiments that are safe to fail[24].'

GMCA is working to an ambitious timeline and transformative scale of action, and is keen to move into a 'delivery' phase. However, when working in an environment of complexity within the climate crisis, which is an unpredictable arena with multiple feedback loops, a 'plan then deliver' approach is high risk. A focus on experimentation is a complement to ongoing action, rather than a substitute.

Rather, experimentation is the means of delivering effective action, given the complexity. For example, in trying to determine how to build a customer service model for retrofit, you could either a) carry out deep customer research, analyse, plan, design a model and then aim to rollout delivery or b) run a lighter touch research exercise, design a prototype, test, gather feedback and adapt. The latter approach means that you might never move into a purely defined 'delivery' phase. To support experimentation in this highly complex, uncertain environment it may be helpful for the organisation to become more supportive of risk-taking to enable research exercises to produce actionable findings. Greater Manchester has the capability to produce innovation, but requires a greater willingness for risk-taking for those innovations to be scaled. As one interviewee said:

> 'We are really good at innovation projects – for example, the demonstrator park in North Manchester. The part that we needed support on is scaling up from a demonstration of innovation to applying that approach to wider areas to make mass change. That's the thing we struggle with.'

Recommendation 2: Create space and expectations of governance innovation across organisational, social and cultural domains.

As outlined above, the CG membership is limited, which can lead to internalisation and a cap on knowledge sharing. In a recent round of the CG meetings there was broad agreement that

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[23] Kattel, R., Mazzucato, M., Ryan-Collins, J. and Sharpe, S. (2018). The economics of change: Policy and appraisal for missions, market shaping and public purpose. Available at: https://www.ucl.ac.uk/bartlett/public-purpose/sites/public-purpose/files/iipp-wp-2018-06_1.pdf.

[24] Snowden, D. and Boone, M. (2007). A Leader's Framework for Decision Making. *Harvard Business Review*. Available at: https://hbr.org/2007/11/a-leaders-framework-for-decision-making.

membership should be widened. A key goal should be to widen the industries and expertise within the CGs, reflecting the fact that the 2038 carbon-neutral living challenge is not only a technical-delivery challenge, but a social, cultural, and institutional challenge, and should include representatives from: trades unions, citizen groups, retailers, digital and tech companies, social innovators, local democracy organisations, think tanks, landlords, tenants' organisations, supermarkets and women's groups.

It should also be an opportunity to widen the membership from within GMCA, bringing in people from other departments who may have complementary skills, and improving understanding and commitment to the mission across the GMCA over the long term. One interviewee noted that he had, 'presented [the same content] to 12 different boards – the Innovation Board, the Local Industrial Strategy Board, the Growth Board, elected officials, and so on.' This resonates with the comments of another interviewee, who said, 'I think we give the impression that it is a green mission, not a Greater Manchester Mission.' The more that the mission can become central to the work of everyone across the GMCA, the greater range of powers and budgets there will be available to push it forwards.

As well as taking responsibility, an effective system of distributed ownership would empower members of the mission team to find potential solutions to barriers and try them out, without the need for sign-off from GMCA. This could better enable the mission to drive forward system-level transformation without needing to rely on GMCA for approval. To do this, the time groups spend together would need to be focused on mapping barriers and generating ideas, with as much engagement as possible.

Currently, CG meetings feature a large amount of technical content, generally delivered in the form of a few short presentations. This approach has worked well for enabling detailed, technical discussions, and it will be important not to lose that level of rigour and information sharing. However, only a small proportion of the people on the call are regularly contributing to the conversation. One interviewee noted that previous meetings, which had been held in person before restrictions due to COVID-19, were more engaged, with teams able to break out into small groups and work intensively on a particular question. GMCA might consider investing in some of the 'dynamic capabilities' that IIPP has highlighted[25] as necessary for public servants today, such as facilitation, coaching and system thinking, to support the CGs while they continue to meet virtually.

A new iteration of the CGs could be designed to increase active participation and dynamic group deliberation. For example, rather than a presentation-and-questions format, meetings could adopt a collaborative problem-solving approach. Members would be invited to bring a problem to the group that could then be discussed in virtual 'breakout rooms' in small groups of around five individuals, rotating around the problems. The objective of the CG would be to 'unblock' stalled parts of the mission and to consolidate the lessons learnt, which could be then shared with other CGs. If the

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Low Carbon CG was struggling to reach commercial landlords, perhaps a retailer or a landlord would be able to find a way forward; if the Sustainable Consumption CG was struggling to find a way to motivate producers to change their packaging to low carbon-intensive materials, perhaps a materials manufacturer or supplier would be able to support. At the end of each CG there might be a few possible solutions to the problems raised. These could be run as experiments, with successes or failures fed back to the group to encourage learning.

Recommendation 3: The governance system will need to navigate and support directed innovation, which requires working with uncertainty and complexity.

Cities and the environment are both paradigmatic examples of complex systems. Complex systems are characterised by a large number of interacting elements, emergence (outcomes arise from relationships between elements), limited predictability, feedback loops, non-linearity, path dependency, openness and adaptability[26][27]. In practice, this means there is a high degree of uncertainty about how to produce the desired results; there may be disagreement among a range of stakeholders; and there are no right answers.

David Snowden and Mary Boone, in their 2007 *Harvard Business Review* article, laid out what this means for leadership in different environments, developing the 'Cynefin' framework that differentiates issues of complexity from those that are 'complicated'. A complicated problem is one that may have many parts, but there is ultimately a clear relationship between cause and effect. Difficult technical problems – for example, building a car – fall into this category. This is the domain of expertise, where progress is made by sensing, analysing and only then responding, and good leadership involves assessing conflicting expert advice and tracking progress.

Recommendation 4: The governance structure will need to help build a wider movement that supports delivering the mission.

Achieving the mission will require system change, which will mean changes in behaviour, incentives and culture (as recognised by the existence of the Behaviour Change CG). GMCA may be overlooking important early-stage chances to experiment with building the foundations of the movement that will enable the mission to later accelerate, such as strong civic participation programmes, digital infrastructure, new contracting mechanisms or new approaches to evaluation. For this, it may be necessary to consider what types of knowledge and experience are needed to support the mission. The section below, on membership, outlines some types of organisations that may be able to contribute.

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[26] Cilliers, P. (2010). What can we learn from a theory of complexity? *Emergence*. Available at: https://www.tandfonline.com/doi/pdf/10.1207/S15327000EM0201_03?needAccess=true.
[27] Snowden, D. and Boone, M. (2007). A Leader's Framework for Decision Making. *Harvard Business Review*. Available at: https://hbr.org/2007/11/a-leaders-framework-for-decision-making.

As well as additional expertise from a wider range of fields, there may be additional opportunities for broad citizen engagement[28] – one interviewee thought there were 'real missed opportunities' here to bring new actors into the mission. While the CGs primarily engaged professionals, GMCA does have some experience leading broader public participation exercises with citizens, such as during the development of the 'Springboard Report'[29]. Ideally, this would be done in a way that enables decision-making from and with citizens, rather than informing them.

Deeper citizen engagement would have three important benefits:

1) It is central to the development and growth of public value in the mission that the public are able to co-create, shape and design the activity. Building symbiotic public-private partnerships that deliver value creation, rather than value extraction, is only possible if both public and private have a 'seat at the table', and genuine decision-making authority and influencing power.

2) It may be possible to generate greater long term and committed engagement. This form of ongoing, durable civic engagement can help develop public value by building trust and respect between different groups that could be leveraged to build new capacities and capabilities.

3) It would give the mission work greater legitimacy and may increase the range of powers that GMCA is able to use effectively. As analysed in the Levers report (report B), GMCA has gained finite powers through its devolved status that it can mobilise towards the mission. Therefore, building public legitimacy and trust may help accelerate mission uptake from the wider public that could mitigate some of GMCA's challenges due to its limited formal powers.

For example, a proposal from GMCA to retrofit a whole street would be seen as an imposition on citizens, whereas if it were a bottom-up suggestion from residents and agreed in a democratic manner it may be more widely acceptable. This relates to the point above about experimentation – this way of working is inherently premised on taking an iterative, test and learn approach. Direct citizen engagement may not be possible to incorporate into the existing CG structure, but could complement it. The annual Green Summits could be a platform to launch deeper and more frequent engagement. The existing 5 Year Environment Plan Forum that is comprised of diverse organisations could also provide a venue for citizen engagement to support the CG structure.

Finally, there are questions of diversity and representation within the CG. In particular, one CG chair highlighted that they are trying to increase the ethnic diversity of the group; another also

[28] Mazzucato, M. (2019). *Governing Missions in the European Union*. Available at: https://www.ucl.ac.uk/bartlett/public-purpose/sites/public-purpose/files/governing-missions-report.pdf.
[29] GMCA. (2018). *Greater Manchester's Springboard to a Green City Region*. Available at: https://www.greatermanchester-ca.gov.uk/media/1317/springboard-report.pdf.

emphasised the importance of making the mission relevant for everyone, asking, 'How do we make this work for neighbourhoods with people struggling to make ends meet?' Engaging marginalised and under-represented communities can be difficult, because individuals from these groups often lack the time and capacity needed to participate in a voluntary capacity. These communities might be more effectively engaged if they received a form of compensation for their time and knowledge, as was the case for participants of the 2017 Citizens' Assembly on Brexit[30].

The following diagnostic questions might be helpful for local government organisations considering membership of mission groups:

Question	Example
Do you have insight into the full value chain?	• In a group discussing retrofit – are producers, installers, customers and financers all in the room?
Do you have all the skills you need?	• Does the group have people experienced in systems change or community engagement? • How could the group draw on the skills across the GMCA to develop the CG?
Does the group amplify voices of marginalised communities? If not, how does GMCA understand how policies will impact different groups?	• In a group thinking about sustainable consumption and production – do you have someone who can provide insight into the gendered, ethnic or class-based differences in shopping behaviour? Will policies remove barriers for all or for some groups?

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[30] Constitution Unit, School of Public Policy, UCL (2017). *The Report of the Citizens' Assembly on Brexit.* Available at: https://citizensassembly.co.uk/wp-content/uploads/2017/12/Citizens-Assembly-on-Brexit-Report.pdf.

Is there enough variety to provide challenge to dominant narratives?	• In a group discussing energy and working on the assumption that there will be a mass conversion to EV – will someone challenge the assumption that streets are still primarily for cars? • What if policies to limit car ownership and use were pursued instead (e.g. removing city centre car parking, 15mph speed limits, congestion charge, increasing the number of car-free roads)? How could GMCA create and shape a market around the 15-minute city?
What is the balance between delivery and direction conversations?	• By bringing in more members who are not part of a task and finish group, it may be easier to identify their purpose, so that the CGs are providing something more than a summary of delivery actions.

Recommendation 5: Develop new forms of performance metrics to track the mission's progress.

The dominant mindset in the discussion around KPIs (although said with some healthy scepticism) was 'what gets measured gets managed.' As shown by the KPI list in Appendix 1, there seems to be a strong reliance on quantitative data, although there is a recognition that some of this data may be difficult to gather and aggregate. This is also complemented somewhat by the RAG ratings, which may leave more scope for judgement. Discussions in some CGs noted that this approach can lead to the perseveration of established behaviour and narrowly honing attention, as people work to the metrics rather than to the mission – something GMCA will want to avoid.

Furthermore, the experience of COVID-19 emphasises the difficulty of assigning metrics in a deeply uncertain world. Thinking about metrics for carbon neutrality, and indeed climate change more widely, needs to bear in mind the fact that the system is characterised by feedback loops, non-linearity and tipping points. While measuring the amount of activity undertaken (e.g. acres rewilded, trees planted, houses retrofitted) is useful, an appreciation of the system dynamics, and of how the system is changing, is vital in metrics.

Building on the previous section, it is also important to note that evaluation for innovation in complex environments is necessarily different to measuring progress in simple or complicated tasks. In his book *Development Evaluation*[31], Michael Patton outlines the evaluator's job in each area. In simple environments, it is to validate best practice and monitor implementation; in complicated environments it is to convert expert advice into testable theories of change and evaluate cause-and-effect dynamics; and in complex environments it is to provide ongoing feedback about *what is emerging* and facilitate regular reflective practice about *what is developing.* GMCA's evaluation approach, focused more on measurement than discussion and understanding, risks using the wrong tools for managing the situation.

However, this is not to suggest that the quantitative KPIs tracked by GMCA aren't useful. Rather, the question is *how* they are used. The Centre for Public Impact has emphasised the importance of measuring for learning[32] rather than just for accountability, as well as creating local governments that can 'fail forward' (i.e. use failure as a spur to innovation and growth)[33]. The CGs currently have 'no process for that – learning is embedded within the membership of the group,' and there is a recognition that 'taking the learning that one person has acquired and sharing it' is a challenging thing that 'isn't often done well, and would be a significant overhead,' according to one CG chair. Another interviewee said that, 'Lessons from previous projects aren't really learnt per se – and this is a wider problem with urban experimentation. No one really cracks down on how to make sure they are adopted as new practices.' This then makes it very difficult to scale and mainstream successful innovations.

In a similar vein, the EU's interim report on its new mission, 100 climate neutral cities by 2030,[34] notes that, 'The goal of the mission is to transform a city. To evaluate the feasibility of such a radical transformation, a qualitative indicator is proposed: *the selected decarbonisation pathway to climate neutrality and the associated transformation drivers to be unblocked.*' The report goes on to suggest other possible indicators, including citizen engagement, modal split of transport, energy use in buildings, percentage of buildings renovated and more. This is a good example of mixed evaluation, where the quantitative data is supported by the qualitative and deliberative assessment of what the barriers that exist are. This may require new forms of collaboration, as highlighted in the section below on operation practice.

As an example of what this might look like, rather than measuring 'number of whole house retrofits' or 'increase in energy certificate ratings D or above' as the current KPI set does, GMCA could ask 'Do we have the tools we need to retrofit at the scale we need to?' Asking this type of question

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[31] Patton, M. (2011). *Developmental Evaluation.* The Guildford Press.

[32] Burgoyne, J. (2020). Measurement for learning: Values and principles. Centre for Public Impact. Available at: https://www.centreforpublicimpact.org/measurement-learning-values-principles/.

[33] Centre for Public Impact. (2020). *How to fail forward: A framework for fostering innovation in the public sector.* Available at: https://resources.centreforpublicimpact.org/production/2020/08/How-to-Fail-Forward.pdf.

[34] European Commission. (2020). *100 Climate-Neutral Cities by 2030 - by and for the Citizens.* Available at: https://op.europa.eu/en/web/eu-law-and-publications/publication-detail/-/publication/82f1df57-b68b-11ea-bb7a-01aa75ed71a1.

might lead to dynamic mission tracking indicators in comparison with the present evaluative approach:

Figure 7: Hypothetical 'mission metrics' – IIPP analysis

New forms of performance metrics to track mission progress
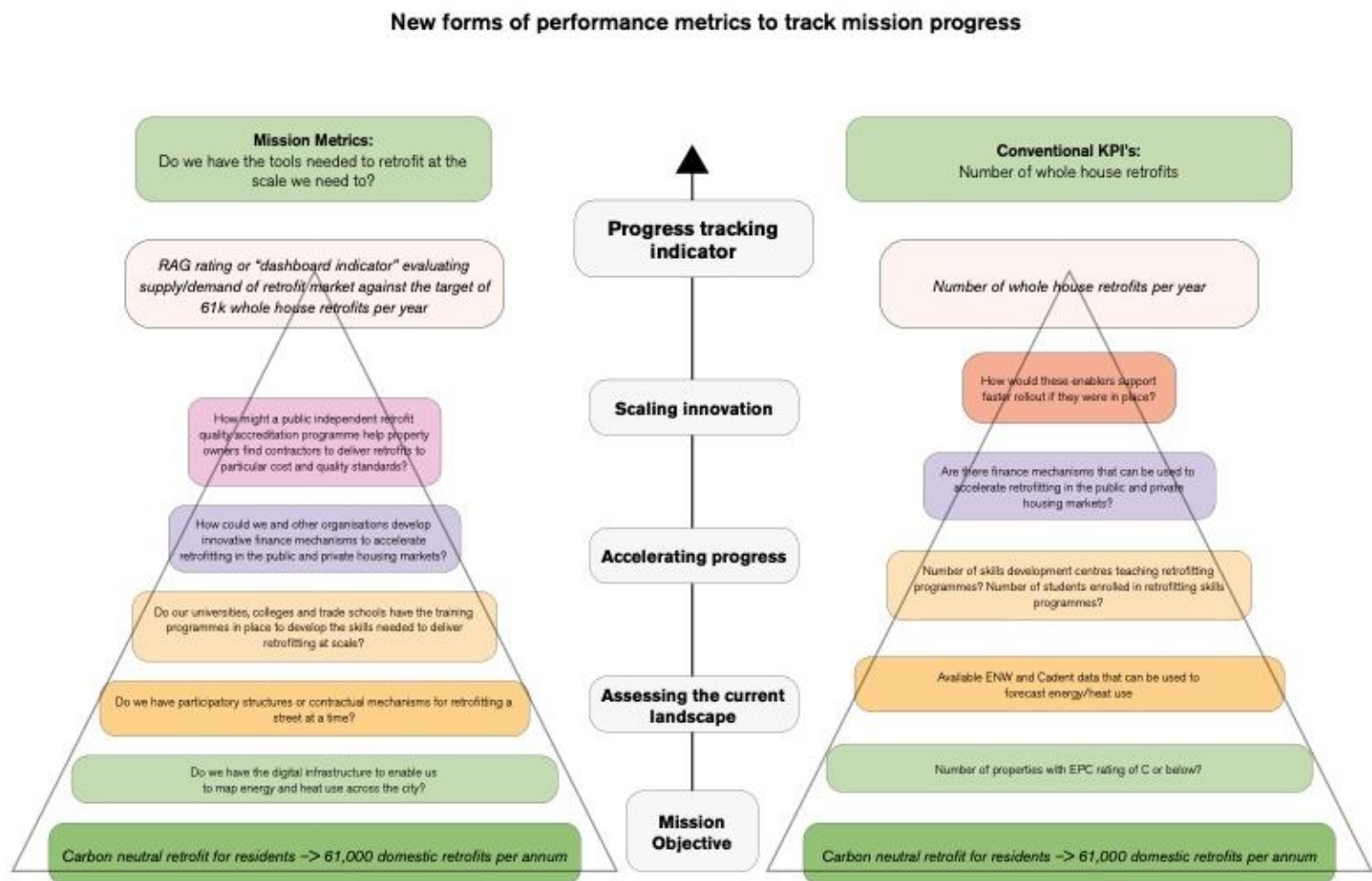
Source: Institute for Innovation and Public Purpose

Milestones might then be conceived of as capabilities rather than quantitative targets. For example, 'By 2022, we will have the capability to retrofit a street at a time' rather than, 'By 2022, we will have completed X thousand retrofits.' This way of working may encourage the mission team to focus on the enablers and drivers in the early stage of the mission, rather than going for the lowest hanging fruit first.

Finally, there may be a gap in thinking about evaluation at the programme level, rather than the project level. As one interviewee said:

'We need something that articulates how project goals fit against overall mission – that mapping piece hasn't been done. There is nothing that says how all of the individual projects deliver against the overall aims. The first step is to do the mapping and to identify gaps. We also need something to articulate budget spending against each of the strategic areas, to see which areas are underfunded.'

Recommendation 6: Reorient the governance vehicles to be a forum for dynamic, exciting joint problem-solving rather than 'programmatic' vehicles.

A significant challenge for the CGs is in maintaining the spirit of openness, experimentation and iteration that was apparent early on in the process[35]. As CGs move from the 'research and learning' phase towards the 'delivery' phase and activities become more embedded over time, there may be a risk of mission activity becoming 'programmatic' – i.e. taking on the management and process characteristics of existing projects. As one interviewee said, 'The mission-based approach gets translated into "things that need to be done" - they are very operational, very delivery focused.' A new mission-oriented structure for overseeing the mission project has been created, but if it is governed by the same characteristics and 'rules of the game' as pre-existing projects and project processes, this could lead to outcomes which are less innovative.

The split in designation between 'research and learning' and 'delivery' phases can be seen as symptomatic of a more traditional process-management approach. Existing process templates are easy to revert into, and the high degree of overlap between the delivery (task and finish groups) and governance (CGs) functions may make this reversion more likely. The mission approach calls for more flexibility and adaptability in management and this can be seen taking shape within some of the CGs, for example with the proposed creation of the Energy Innovation Agency.

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[35] Mazzucato, M. and McPherson, M. (2019). *What the Green Revolution can learn from the IT Revolution: A Green Entrepreneurial State*. Available at: https://www.ucl.ac.uk/bartlett/public-purpose/sites/public-purpose/files/iipp_policybrief_08_green_entreprenurial.pdf.

Appendix 1: GMCA Key Performance Indicators

5-Year Environment Plan Priorities

Ref	Key Priorities (2024)	Status		Measure	% Towards target	Commentary
E1	Increase local renewable energy (electricity) generation, adding at least a further 45MW by 2024.	↑	Green	Additional renewable capacity (MW)	11%	132 MW of renewable capacity generated in March 2019, 5MW higher than in June 2018 and 11% progression towards target. NOTE: Due to the closure of the Feed-in-Tariff in March 2019, there will be no further releases of data.
E2	Decarbonise how we heat buildings, adding at least a further 10TWh of low carbon heating by 2024.	↔	Green	Additional energy from low carbon heat sources (TWh). Note: ONS measured in MW	TBC	82 MW of GM accredited renewable heat sources generated up to May 2020 (non-domestic only, no change from Jan-20).
E3	Increasing the diversity and flexibility of our electricity supply, adding at least a further 45MW of diverse and flexible load by 2024.	↔	Green	Additional flexible and diverse load available (MW)	TBC	Measure for increasing the diversity and flexible load of electricity is under review.
B1	Reduce the heat demand from existing homes with retrofit measures installed on a scale of 61,000 homes per year, achieving 57% reduction in heat loss.	↔	Red	No of whole house retrofits carried out	TBC	Reporting on retrofit measures to reduce heat loss by 57% in homes will come from ERDF projects and self-reporting from stakeholders.
B2	Reduce the heat demand from existing commercial and public buildings with a 10% reduction by 2025.	↓	Amber	Increase in energy certificate ratings D or above	TBC	86.9% of GM lodgements have an energy efficiency rating of D or above (EPC/DEC) in Q2 2019. This is a slight decrease from Q2 2018 of 0.7%. Overall we outperformed the national average by more than three percentage points in the Q2 2018 data.
B3	Reduce the heat demand in new buildings.	↑	Green	TBD	TBC	Measures on reducing heat demand in new buildings will be included in revised GMSF.
SCP1	Producing goods and services more sustainably, moving to a circular economy. 38% reduction in industrial emission by 2025.	↔	Green	Reduction in CO2 consumption emissions	TBC	Measure/s to monitor Sustainable Consumption and Production is under review. Mapping of material flows research to commence with PhD student from UoM.
				No of re-use pilots launched in Greater Manchester (3 per year)	20%	Refill pilot launched in Bury and Tameside. 'Grab your Cup' pilot launched in Jan 2020. 20% progression towards 5-year re-use target (3 per year).
SCP2	Becoming more responsible consumers - limiting any increase in waste to 20%.	↔	Green	Domestic residual waste production (kg/hh/yr)	Increase of 9%. Within 20% limit.	Increase of 40.53kg/household of residual waste from 2017/18 to 2018/19.
				No of streams of avoidable single-use plastic taken out of public estate - TBD	TBC	No of streams of avoidable single-use plastic removed from public estate will be reported against the GM Plastic Pact. A single-use plastic spend review is now underway.
SCP3	Managing our waste as sustainably as possible to achieve a recycling rate, 55% by 2024, and 65% by 2035.	↔	Amber	Yr on Yr increase in recycling rates (%)	87%	Recycling rate (2018/19) is 47.9% up 0.8% from 2017/18 against a target of 55% for 2024. Landfill diversion rate (2018/19) is 94%.
SCP4	Reduce unnecessary food waste.	↔	Amber	TBD	TBC	Measure under review. Cannot be monitored through waste data flow at present as GM has mixed food and garden waste collection and disposal. Data has been provided by Too Good To Go on reduction in food waste in GM (meals saved). Potential to receive the same form Olio and Karma.
NE1	Managing our land sustainably, including planting 1m trees by 2024.	↑	Amber	Amount of peatland restoration and management for carbon sequestration	TBC	Measure to monitor peatland restoration is under review.
				No of trees planted	46%	2019/2020 target of 100,000 trees to be planted with 1 million by 2024. Currently at 459,929 trees planted against 1 million target by 2024.
NE2	Managing our water and its environment sustainably.	↑	Amber	Water bodies enhanced (per km)	TBC	47km of water body enhanced in 2016-2018. Target of 542km by 2027.
NE3	Achieving a net gain in biodiversity for new development.	↑	Amber	TBD	TBC	Measure under review. Proposed indicators are: Number of projects that are aiming to deliver biodiversity net gain; and overall predicted biodiversity unit % change.
NE4	Increasing investment into our natural environment.	↑	Amber	Amount of non-public investment	TBC	Reporting on increasing investment in natural environment will be within Natural Capital Investment Plan.
NE5	Increasing our engagement with our natural environment.	↑	Amber	Increase in number of people engaged	TBC	NOTE: 2018/19 was last reporting year of MENE. To be replaced with People and Nature survey from 2020/21. Experimental UK statistics available at :https://www.gov.uk/government/statistics/the-people-and-nature-survey-for-england-monthly-interim-indicators-for-may-2020-experimental-statistics. Currently investigating additional sampling for GM.
CC1	Embedding climate change resilience and adaptation in all policies.	↓	Amber	No of policies	TBC	Indicators to be confirmed as part of the IGNITION project and Resilience Strategy.
CC2	Increase the resilience of and investment in our critical infrastructure.	↑	Green	No of planning permissions granted contrary to EA advice on flood risk	TBC	Measure is being reviewed as seems at odds with the overarching action.

5-Year Environment Plan Priorities

Ref	Key Priorities (2024)	Status		Measure	% Towards target	Commentary
CC3	Implement a prioritised programme of nature-based climate adaptation action.	↔	Green	Uplift in urban green infrastructure	TBC	IGNITION project will work on baseline and appropriate urban adaptation uplift targets (i.e. 10% increase in urban GI).
CC4	Improve monitoring and reporting.	↑	Amber	TBC	TBC	Indicators to be confirmed as part of the IGNITION project and Resilience Strategy.
T1	By 2040 increase the use of public transport and active travel modes to support a reduction in car use to no more than 50% of daily trips made by Greater Manchester residents with the remaining 50% made by public transport, walking and cycling.	↔	Green	Ratio of journeys made by car versus sustainable modes of transport	Current ratio: 39/61	Current ratio of journeys made by car vs sustainable modes of transport is 39/61 against a target of 50/50 for 2040.
				Increase in proportion of all trips made by cycling and walking (%)	0.5% increase in 2018/19 compared to 2015/16.	28.5% of all trips made by cycling/walking in 2017/18 up from 27% in 2015/16.
T2	Phase out of fossil-fuelled private vehicles and replace them with zero emission (tailpipe) alternatives and implement a charging infrastructure to support expansion of 200,000 EV vehicles in our city-region by 2024.	↑	Green	No of plug-in vehicles registered licensed in GM (Source: DfT vehicle statistics)	51% increase from 2018	4,951 plug-in vehicles registered at end Q1 2020, 20% increase from Q2 2019.
				Increase in No of ultra-rapid charge points installed (GMEV network)	Currently 4 in GM (all in SK4)	GM Zap Map data as of 13/07/2020: 4 ultra rapid charges (-), 58 rapid charges (+2), 442 fast devices (-4) and 29 slow devices (-).
T3	Tackle the most polluting vehicles on the road. (Up to 200,000 low carbon vehicles by 2024).	↑	Green	TBC	150+ buses retrofitted	150+ buses retrofitted to date through Clean Bus Technology Fund. Full reporting to be aligned with Clean Air Plan.
T4	Establish a zero emissions free bus fleet. 100% of all buses are zero emissions (tailpipe) by 2035.	↑	Green	No of new zero emissions buses entering the fleet	Currently 3 in the TfGM fleet. Awarded funds for 23 more. Stagecoach deployed 32 EV double deck buses.	3 zero emission buses in TfGM fleet to-date. Stagecoach deployed first of 32 full EV double deck buses.
				Proportion of total bus fleet that are zero emissions	TBC	Measure under review - Reliant on operators sharing this data on an infrequent basis. Some operators do not share any data.
T5	Decarbonising freight transport and shifting freight to rail and water transport.	↑	Red	Delivery of freight roadmap	In progress	Refreshed working draft of GM Freight Strategy has been developed which will be used to provide a key building block in developing a costed roadmap for reducing freight emissions.

Appendix 2: Missions in practice

Summary

Mission-oriented innovation is a new approach to innovation. It encourages government organisations to take on a market-shaping role, rather than a market-fixing one, and direct the market by transforming the focus of investment towards societal 'grand challenges'. Missions define an ambitious goal at a high level and use this to create a long-term policy landscape that mobilises various actors to engage in bottom-up experimentation across sectors. While missions set the direction for a solution to a grand challenge, they are not created to specify how to achieve a successful outcome. Instead, missions stimulate the development of various different solutions intended to meet grand challenges by enabling actors to take risks and experiment together to develop innovation solutions.

Overview to missions

At IIPP, we have set out five criteria for the development of mission – a mission should:

- Be bold and inspirational, with wide societal relevance.
- Set a clear direction: targeted, measurable and time-bounded.
- Be ambitious, but realistic.
- Encourage cross-disciplinary, cross-sectoral, cross-actor innovation.
- Involve multiple, bottom-up solutions.

Missions and the local context

Mission-oriented policy in the local, urban and regional context has at its core the belief that local places have enormous capacity to drive inclusive economic growth on the local level, as well as influence nation-wide institutions and policies. Local institutions and communities can shape the future of the local economy collectively and impactfully. Missions acknowledge that public servants have a role in shaping the economy and economic growth, and this applies at the local and regional level. This includes the use of existing place-shaping powers, partnerships and services to support people, local labour markets and local organisations.

In the context of a local community, missions should speak to the values and aspirations of different residents and give residents a sense of ownership. This can be done by including and engaging community members in the process of identifying and shaping missions. Local mission-oriented policy recognises that a thriving local place has to be founded on coalitions, from community members to voluntary organisations to public sector institutions. Given flexibility and proper resources, such diverse groups of collaborating local stakeholders are best placed to guide decisions about local climate policy.

The local context is an environment distinct from policymaking at the national or international level. Locally driven missions have to take into consideration both the particular opportunities, as well as the limitations, of local government. For instance, local and combined authorities can make use of their influence and utilise powerful levels (such as in planning, public protection, procurement and the public estate) in pursuit of missions. Moreover, local government organisations often exercise strong understanding of the local landscape and cultivate a close relationship with local businesses and citizens. They can also make use of having more agility and margin to innovate and experiment with different policy approaches. On the other hand, their agency is limited in comparison to central government, which requires them to form local coalitions and lobby central government to gain additional policy levers and resources.

Shaping a green and inclusive local economy requires local, urban or regional authorities to take a market-shaping role. In order to be able to do so, they require a substantial degree of political autonomy from central government, as well as financial resources and local flexibility. Openness to experimentation and testing of approaches, as well as an ambitious, coalition-building approach to leadership, are key success factors for missions at the local level.

Mission-oriented local industrial strategy

In 2018, GMCA developed one of the first modern local industrial strategies (LIS). This built on the work of the national industrial strategy, as well as the *Independent Prosperity Review* (2019) and the GM Strategy, *Our People, Our Place* (2017). In 2018, GMCA worked with IIPP to develop its ground-breaking 2038 carbon neutrality mission. IIPP's thought-starter report, *A mission-oriented approach to clean growth* (created as part of the Greater Manchester Independent Prosperity Commission), acted as an initial roadmap for the city region. The report took a mission-oriented approach to Greater Manchester's grand climate change challenge and carbon-neutrality target and framed this as a citizen-oriented mission for 'carbon neutral living' in the city-region by 2038. The paper provided an introduction to the mission-oriented approach to innovation and policy, the key criteria for selecting and framing successful missions, a hypothetical mission roadmap and a series of case studies.

The GM LIS identified key strengths and opportunities around clean growth, health innovation, advanced materials and manufacturing, and digital, built on the foundations of ideas, people, infrastructure, the business environment and places. The mission-oriented innovation approach was an important part of the LIS, as it provided the structure and framework for the clean growth agenda. GMCA has been a trailblazer and other places are now developing their own local industrial strategies, with Liverpool's and Leeds' due for publication shortly. Since 2020, IIPP has been working with Greater Manchester to observe and support the development of the mission roadmap as it has been translated into action in the city-region through its LIS and 5 Year Environment Plan.

Appendix 3: Challenge Group membership

Challenge Group members, split by organisation type

Institution type	5YEP	Buildings	Comms	Energy	SCP	Natural capital		Total excluding duplicates
Media	0	0	1	0	0	0		1
Local public sector	4	0	3	2	4	2		9
Local authority	1	2	1	1	7	2		14
Consultants	0	5	0	8	4	0		14
National agency	3	1	3	3	1	7		15
Housing/ construction	0	15	0	2	0	0		16
Business	4	5	5	5	7	2		18
NGO/charity	8	2	7	2	4	4		23
Technology	1	11	0	14	0	0		23
Infrastructure	1	8	4	11	4	2		27
Academia	5	5	1	8	10	2		29
GMCA	4	11	12	5	13	8		38
Total	31	65	37	61	54	29		227

Challenge Group members, split by organisation type (%)

Institution type	5YEP	Buildings	Comms	Energy	SCP	Natural capital		Total excluding duplicates
Media	0%	0%	3%	0%	0%	0%		0%
Local public sector	13%	0%	8%	3%	7%	7%		4%
Local authority	3%	3%	3%	2%	13%	7%		6%
Consultants	0%	8%	0%	13%	7%	0%		6%
National agency	10%	2%	8%	5%	2%	24%		7%
Housing/ construction	0%	23%	0%	3%	0%	0%		7%
Business	13%	8%	14%	8%	13%	7%		8%
NGO/charity	26%	3%	19%	3%	7%	14%		10%
Technology	3%	17%	0%	23%	0%	0%		10%
Infrastructure	3%	12%	11%	18%	7%	7%		12%
Academia	16%	8%	3%	13%	19%	7%		13%
GMCA	13%	17%	32%	8%	24%	28%		17%

Total	100%	100%	100%	100%	100%	100%		100%