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	D. Internal tracking report or database
Summary/brief description of report	Report to record patient finance opportunities
Date of report	10/12/20

Supporting documents: attach in pdf format

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Identifying finance: Cities and mission-oriented innovation

A report prepared for EIT Climate-KIC by IIPP

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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 financing approaches and mechanisms 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 analyses the approaches cities have taken to finance clean growth missions and the mechanisms that may be utilised to crowd in funding for missions from relevant actors. In addition to the budgets and revenue that are reserved for funding core services, cities have utilised a variety of measures to mobilise public and private finance in support of mission-oriented programmes. These can be mechanisms taken forward expressly by public sector institutions, such as directed procurement. There are also approaches that cities can take to shape private investor actions, such as creating investible assets.

Cities select and develop financing measures to deliver on their policy ambitions within the relatively restricted boundaries of urban areas, and the constraints of national economic frameworks and political decisions. This report lays out the financing measures that GMCA has established for its mission, and reflections on its strengths and challenges in pursuing a mission-oriented innovation approach to clean growth.

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 that currently inhibits cities' conceptualisation around clean growth and required systems change, and this requires deep exploration and new economic approaches.

In particular, the PELICAN project enables IIPP to work closely with the city-region of Greater Manchester to demonstrate, at city level, the mission-oriented 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.

[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.

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Executive summary

This report shows that Greater Manchester Combined Authority (GMCA) has been able to largely initiate mission activity during the past year without significant mobilisation of public or private finance. However, for Greater Manchester's (GM) mission to be successfully implemented, GMCA will have to pursue different measures to direct innovation, using a variety of forms of patient public finance, crowding in various private finance options and supporting blended finance mechanisms.

One of the core characteristics of missions is that they are able to set a direction for the market, that enables the mobilisation – indeed the redirection – of private finance towards the mission itself, both as a co-investor alongside public money, and also independently, as business needs come to coincide and overlap fully with mission needs.

Markets will not find the green direction at the pace demanded by the current scientific projections on their own — there is not yet a ready-made route that will make multi-directional, experimental, green innovation profitable in the timeframe science demands[3]. Only when there is a stable and consistent direction for investment will regulation and innovation converge along a green trajectory. Business does not invest unless it sees an opportunity for growth, so turning action on the climate crisis into opportunities for investment and innovation is key. This requires more than tax incentives — it requires bold investments like those witnessed in Roosevelt's New Deal in the wake of the Great Depression[4].

As the mission in GM enters into its second year, there is much more work to do to align mission practice with mission theory, and ensure that the direction being set by the mission is genuinely influencing and replicated within the actions, business models, and forward-looking investment decisions of private and third sector organisations in the city-region, as well as the full spectrum of public sector activity. To support this shift, this report explores various public and private finance measures that GMCA could pursue to increase its mission practices with green finance approaches.

Recommendations for Greater Manchester

We make three recommendations for Greater Manchester to consider in the second year of its mission and beyond:

1. **Scanning the landscape:** Financing Greater Manchester's mission will not require a binary choice of public or private instruments. Rather, the mission requires a mix of public, private

[3] Mazzucato and Perez. (2015).
[4] Mazzucato et al. (2015).

and blended finance measures. It is crucial that GMCA prototypes and identifies 'the right mix' of finance needed to support innovation and scale action.

2. **Develop an umbrella vision to finance the mission:** The CGs have successfully developed numerous mission activities and have begun delivering several projects. However, the CGs have largely avoided examining opportunities that may emerge from a holistic mission budget. Therefore, an umbrella vision should be developed and put forward between GMCA and key partners.

3. **Undertake highly visible projects:** Greater Manchester's mission requires significant public and private finance. The mission would be well-served by deliberately undertaking a high-profile project that could quickly build momentum in support of the mission.

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 for cities to scan the finance landscape to identify the right types of public, private and blended funding instruments that could support clean growth.
2. Cities could take a more active role generating patient public finance revenue streams to deliver their missions. This will require new approaches to risk-taking and decisions about investing in areas of uncertainty.
3. There are lots of sources of finance that exist that could support the climate transition. Cities should develop a finance vision with their key partners and build relationships with these funders early on during the mission activity process.
4. Cities are not able to fund the climate transition on their own. They must analyse how difference sources of finance can be mobilised to support clean growth and co-fund the transition.

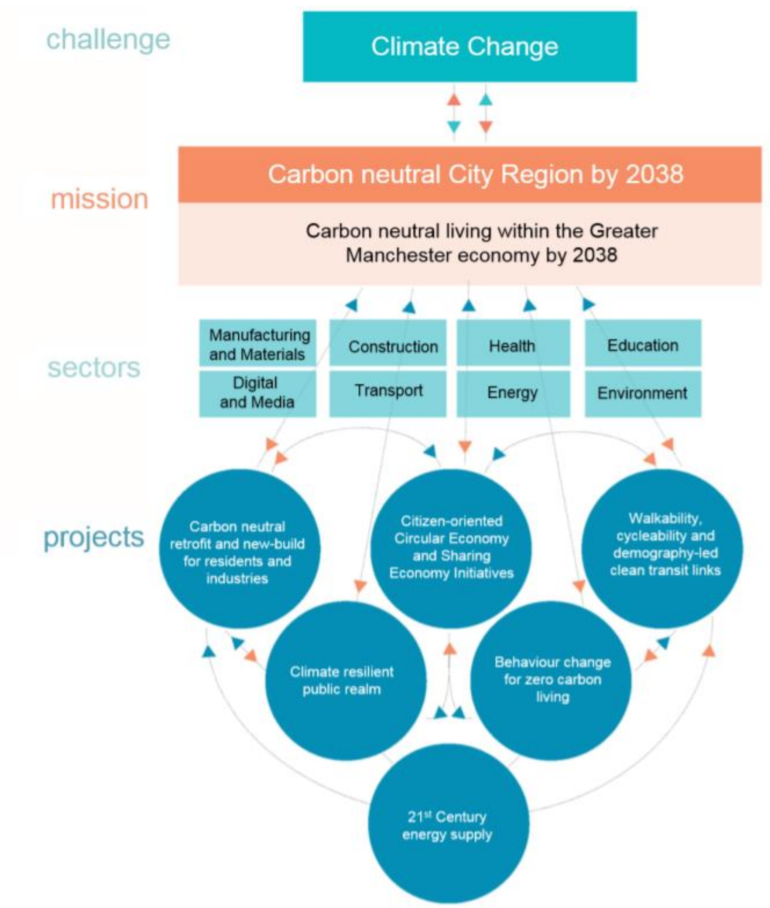
Context and approach

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[5]. 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[6].

Figure 1: Mission roadmap for Greater Manchester: Carbon-neutral city by 2038



Source: Institute for Innovation and Public Purpose

[5] 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.
[6] Mazzucato, M., McPherson, M. and Hill, D. (2019). *A mission-oriented approach to clean growth. Greater Manchester Independent Prosperity Review.* Available at: https://www.ucl.ac.uk/bartlett/public-purpose/publications/2019/sep/mission-oriented-approach-clean-growth.

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 forum 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 it has been completed virtually.

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A short introduction: The role of patient public finance in innovation

Innovation requires finance. But finance is not neutral – the type of finance that is available affects the types of investments made[7]. Much of the work that GMCA need to do in order to achieve their mission is high risk and comes with returns over the medium to long term (for example, decarbonising heating by rolling out hydrogen fuel). But much private finance is risk averse and prioritises short-term returns – for instance, the typical 'exit' for a private equity firm buying a company is around five years[8,9].

It's not a surprise, therefore, that in many countries the early stage of the innovation chain is primarily financed by public actors. In this way, the state acts boldly to create new markets by acting as an investor of first resort. Crucially, in creating those new markets the state has been able to mobilise or 'crowd in' private finance[10]. For example, early government investments in bio-tech enabled the nascent industry to get off the ground; in 2018, venture capital invested over $10bn[11]. The nanotech sector similarly benefitted from decisive state decision-making in the late 1990s, when the US took a visionary stance through the development of the National Nanotechnology Initiative (NNI), shaping a long-term policy framework to support R&D in atomic, molecular and supramolecular research. Nanotech is now considered to be the next 'general purpose' technology, with applications across multiple sectors, becoming a foundation for economic growth.[12] The NNI programme works by allocating funding to participating federal agencies, including the National Institutes of Health (NIH), the Department of Energy (DoE) and the Food and Drug Administration, to develop multi-sector expertise and leverage distributed resources.[13] More than anything, investors need confidence about the future growth and direction of an industry to make investments.

While historically public investment has been particularly focused on the front-end of the innovation pipeline (such as basic research or university research), in the 21st century governments are increasingly recognising the need to be active across the value chain in order to direct innovation towards social challenges. As argued by Mazzucato (2018), 'Companies and developers

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[7] Mazzucato, M. and MacFarlane, L. (2019). *A mission-oriented framework for the Scottish National Investment Bank*. Available at: https://www.ucl.ac.uk/bartlett/public-purpose/sites/public-purpose/files/mission-oriented-framework-for-snib_final.pdf.
[8] Lewis, A. (2017). PE hold times keep going up. Pitchbook. Available at: https://pitchbook.com/news/articles/pe-hold-times-keep-going-up.
[9] Gaddy et al. (2016). *Venture Capital and Cleantech: The Wrong Model for Clean Energy Innovation*. Massachusetts Institute of Technology.
[10] Mazzucato, M. and MacFarlane, L. (2019). *Patient Finance for Innovation-Driven Growth*. Available at: https://www.ucl.ac.uk/bartlett/public-purpose/sites/public-purpose/files/180911_policy_brief_patient_finance_april_2019_edit.pdf.
[11] Lightbown, S. (2018). Is VC's insatiable appetite for biotech sustainable? Pitchbook. Available at: https://pitchbook.com/news/articles/is-vcs-insatiable-appetite-for-biotech-sustainable
[12] Mazzucato, M. (2013). *The Entrepreneurial State*. London: Anthem. (Penguin 2015).
[13] National Nanotechnology Initiative (NNI) website. (2019). See: https://www.nano.gov.

in green sectors must be able to grow with the confidence that their work will continue to be funded both upstream and downstream, from basic research to increase scientific and technological knowledge, through to applied research into real-world problems.[14]' Institutions such as national investment banks (NIBs) are being given the mandate that enable them to support a wide range of economic objectives and respond to emerging priorities. Although some NIBs are limited by their mandate to support particular sectors, types of customers or activities, there is growing consensus that those that are more 'mission driven' (including KfW, BNDES, European Investment Bank and China Development Bank) tend to be more effective than those focused on more neutral economic objectives, such as promoting 'growth' or 'competitiveness'[15].

IIPP has worked extensively in this area, from supporting in the design of the Scottish National Investment Bank to the PUFFIN research project looking at public sector financial institutions across the macro, meso and micro levels of the economy. The PUFFIN project emphasises the importance of the financial eco-system, including central banks and macro-prudential policy[16]. Clearly, the ability of GMCA to influence these aspects of national policy is limited. This report looks at what public finance options are available to GMCA, how they have structured their green investments and what that has meant for driving innovation in the mission.

From moon shots to wicked problems

In the mission to put a man on the moon, public finance led the way, both in terms of funding early-stage research and providing a lead market (primarily through Department of Defence procurement) to enable inventions to scale. The technological breakthroughs that came from that mission – the internet, GPS, SIRI – provided the platform on which today's richest companies have been built. The initial public investment mobilised subsequent private investment, driving innovation and creating new markets.

Climate missions require different types of innovation – social, organisational and behavioural in addition to technological – and both require and attract different types of investment. From a public investment point of view, similar traits are need – long-term, patient, strategic finance is a cornerstone of shaping new markets. Conventional private finance sources, such as venture capital or equity investors, have largely been absent from investing in missions during the early stages of the innovation chain. But there may be new types of private investor who would not have been involved in the moon-shot. Philanthropists, corporate social responsibility funds and citizen financing are just some of the ways that private finance may mobilise behind the mission, as well

[14] 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.
[15] Mazzucato, M. and MacFarlane, L. (2019). *A mission-oriented framework for the Scottish National Investment Bank*. Available at: https://www.ucl.ac.uk/bartlett/public-purpose/sites/public-purpose/files/mission-oriented-framework-for-snib_final.pdf.
[16] See: https://www.ucl.ac.uk/bartlett/public-purpose/sites/public-purpose/files/briefing_pack_puffin_project_final_web.pdf.

as traditional profit-seeking investors. Understanding these different investors' needs and finding ways to combine different pools of funding will be crucial for GMCA in providing the right kind of finance to the mission.

GMCA: Financing the mission

The aim of this section is to analyse the volume and structure of funding that supported the mission, and the instruments that were used to do so. However, there is no centrally held mission budget and the project team did not have access to the funding that specific projects have received (all of which are from other funding sources, rather than GMCA itself). As one interviewee noted, "There has never been a dedicated budget as a single source, or that articulates how different budgets come together. There is nothing that describes the spend against the mission overall."

Rather than quantitative financial analysis, this section takes a qualitative approach, primarily informed by interviews and focus group research, as well as policy documents. The key learning is that, unlike NASA putting a man on the moon, or the UK industrial strategy, there is no central mission budget; the main resource committed from GMCA has been staff time (which does, of course, come with its own internal costs). Project work within the mission has been funded by grants from institutions, such as the UK government Department of Energy, Food and Rural Affairs (DEFRA), Department for Business Energy Innovation and Skills (BEIS) or the European Union (EU). For example, the Natural Course project, which aims to improve water quality in rivers in the North West, is part of the EU LIFE programme and has been allocated €12m of its €20m from the EU[17]. In the first year of the mission, GMCA has focused on establishing the governance structures and building the relationships that will be the foundation of future work.

Partly, the reliance on external grant funding reflects the reality of work at city-region level in the UK. Even before the pandemic, budgets were already tight, with local authorities having faced significant cuts following the 2008 financial crash and 10 years of austerity. A study published in 2020 by the think tank IPPR found that local authorities in England have on average reduced their annual spending on services by about 13% between 2009-10 and 2018-19, although the impact of austerity has not been felt equally across the country[18]. For example, in the North West, where Greater Manchester is located, the region saw its spending cut by 20% over this period while the South had its spending cut by 9%. On top of this, the COVID-19 pandemic has led to even tighter budgets, with revenue streams drying up (for example, massive reductions in the number of people

[17] EU website. (2020). Available at: https://ec.europa.eu/environment/life/project/Projects/index.cfm?fuseaction=search.dspPage&n_proj_id=5439.
[18] Johns, M. (2020). *10 years of austerity: Eroding resilience in the North*. IPPR North report. Available at: https://www.ippr.org/files/2020-06/10-years-of-austerity.pdf.

using public transport), while the need for local services has increased, with unemployment having risen 91% since March 2020[19].

Against this backdrop, the strategic approach outlined by the GMCA interviewees has been to find funding to match the needs when opportunities arise, so that, as in the words of one interviewee, 'Ambition is not limited to the size of the budget.' There was also a worry that if there were a central mission budget, then there would be more pressure/expectation to spend it, even if it wasn't delivering high value or impact. As both a symptom and a result of this approach, one Challenge Group[20] (CG) chair saw the value of the CGs as identifying synergies and strengthening existing projects through collaboration, rather than enabling new work to happen: 'The real power of the mission-based approach is about aligning things so that they are all moving in the same direction.'

However, there is widespread recognition that as GMCA moves into the second year of the mission, the focus has to shift to finding finance. As one CG member put it, 'There's a need to start attracting resource – there cannot be another year of deciding what we want to do.' The establishment of two funding-oriented organisations, the GM Environment Fund and the IGNITION project, as outlined below, is aimed at mobilising private finance to support nature restoration by creating investible assets that provide a financial return. This is one strategy open to local governments looking to finance the green transition in the UK, but far from the only one.

The remainder of this section looks at specific financing mechanisms that GM may pursue over the next few years, most notably the GM Environment Fund, as well as the Energy Innovation Agency and the RetroFit Accelerator.

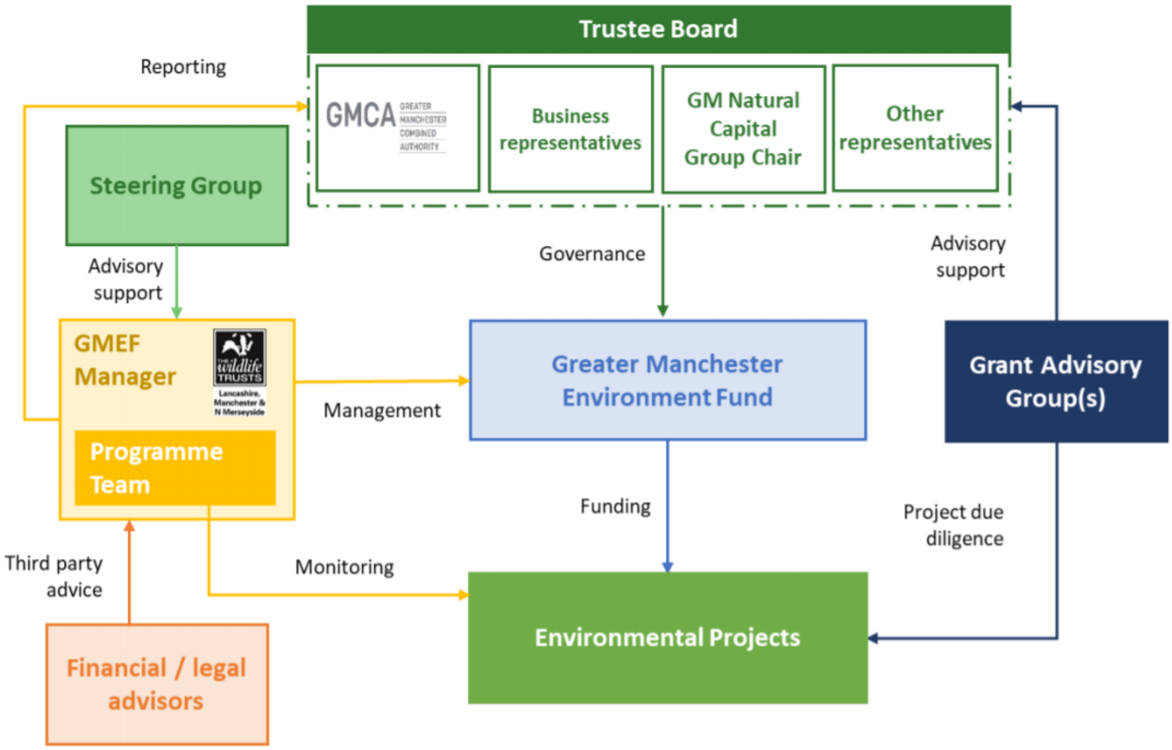
The following section provides a snapshot of potential financing mechanisms, both public and private, that UK local authorities could consider.

The GM Environment Fund

The cornerstone of GMCA's drive to secure more private investment to support the mission is the GM Environmental Fund. This is the UK's first regional environmental fund, targeting social, environmental and financial outcomes. It has been set up as an independent charitable body, and initially it will provide a unified governance structure to align funding from the public sector, foundations and aligned corporates, providing grant funding to relevant projects[21].

Figure 2: Initial governance structure of the GM Environment Fund

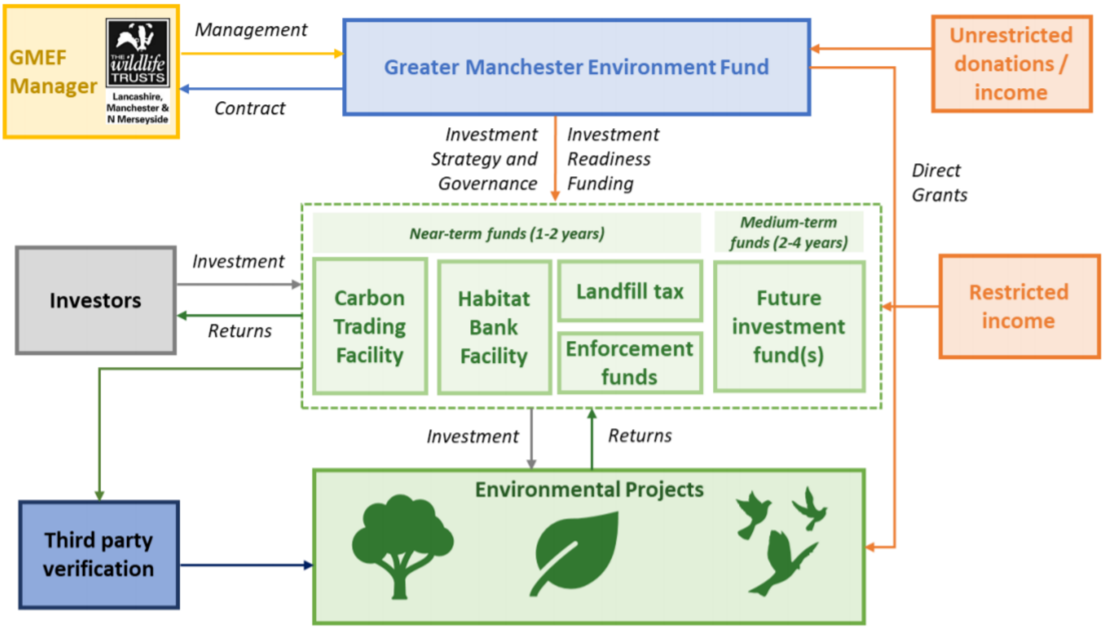
[19] Bounds, A. (2020). Investing in infrastructure alone won't level up UK, economists say. Financial Times. Available at: https://www.ft.com/content/4c9071ed-f187-48a0-8b07-e4bf191177d6
[20] The Challenge Groups (CGs) are five governance groups that take on the oversight of the mission.
[21] GMCA. (2020). *GM Environment Fund Update*. Available at: https://democracy.greatermanchester-ca.gov.uk/documents/s8616/15%20GM%20Environment%20Fund%20Update.pdf.



Source: GMCA

In the longer term, the objective of the fund will be to mobilise private investment around specific sub-funds that are able to provide a return. The two opportunities most likely to be deployed first are a carbon trading facility and habitat banking, driven by changes in regulation (specifically on the need for development to provide a Biodiversity Net Gain – see details below). The governance structure of the fund will evolve in line with the growth of the fund's operations, moving towards the structure shown in Figure 3 below. Ultimately its objective is to build a self-sustaining local environmental impact investment sector.

Figure 3: Future governance structure of the GM Environment Fund



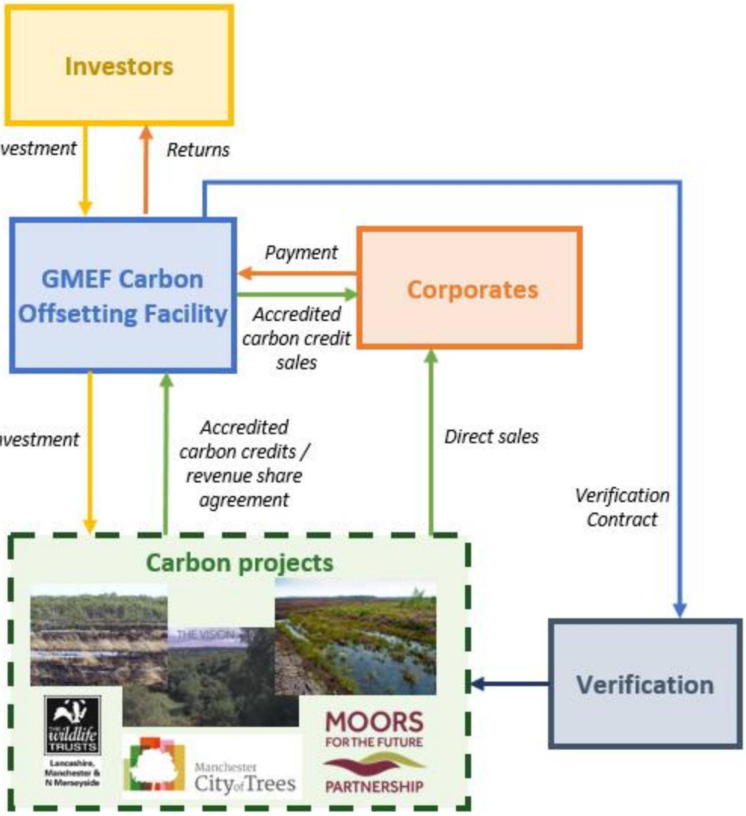
Source: GMCA

The carbon trading facility will accredit and monetise carbon credits from natural assets, focused, in particular, on peatland restoration and the creation of woodland habitat. According to GMCA, restoring the peatlands that have been destroyed could reduce emissions by c. 200k CO_2e per year and GM is planning to plant 1 million trees by 2024 as part of the Northern Forest initiative[22].

Companies are increasingly looking for local carbon mitigation as a result of policy and consumer pressure, so there is a potential investment pot to tap in to. This also shows the importance of the 'whole system' approach and engaging everyone in the mission – the more that people in GM are willing to put pressure on companies to change their behaviour, the more companies will need to invest.

[22] The Northern Forest website. (2020). See: https://www.woodlandtrust.org.uk/about-us/what-we-do/we-plant-trees/the-northern-forest/

Figure 4: Carbon trading facility structure



Source: GMCA

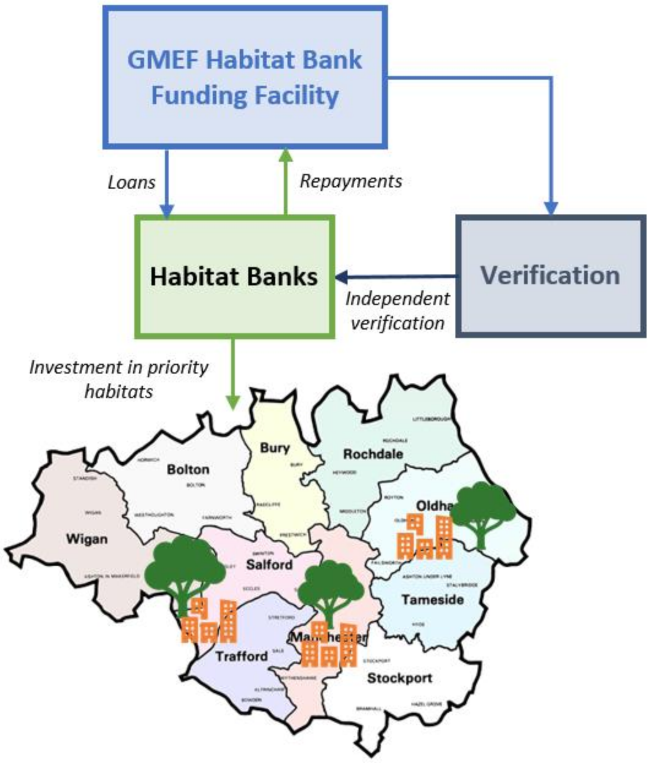
Meanwhile, the upcoming Environment Bill will enshrine Biodiversity New Gain (BNG) in law by 'requir[ing] developers to ensure habitats for wildlife are enhanced, with a 10% increase in habitat value for wildlife compared with the pre-development baseline,' and is expected to generate £200m revenue per year from developers for habitat creation.[23,24]

GMCA's planned habitat bank funding facility will provide developers with 'off the shelf' options for BNG, creating a more streamlined development process, while providing upfront financing to create and restore strategic habitats in advance of development impacts. It could also be used to accelerate the delivery of the GM-wide Nature Recovery Network that Lancashire Wildlife Trust (LWT), who are the GMEF managers, are working on and is part of a wider Natural England strategy. This network, based on the analysis presented in the Greater Manchester Ecology Unit's

[23] Department for Environment, Food and Rural Affairs. (2019). Environment Bill summer policy statement: July 2019. Available at: https://www.gov.uk/government/publications/draft-environment-principles-and-governance-bill-2018/environment-bill-summer-policy-statement-july-2019.
[24] Department for Environment, Food and Rural Affairs. (2019). Biodiversity net gain and local nature recovery strategies. Impact assessment. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/839610/net-gain-ia.pdf.

Ecological Framework for Greater Manchester[25], identifies five types of 'biodiversity opportunity areas' in which different policy interventions can support habitat recovery. While this analysis is now over 10 years old, it foreshadows another important change in the upcoming Environment Bill, which will be a new statutory requirement for local nature recovery strategies: 'These strategies will help to map out important habitats and opportunities for the local environment to be improved, linking communities' knowledge and priorities with national environmental objectives.'[26]

Figure 5: Habitat bank funding facility structure



Source: GMCA

[25] Richardson, D., James, P. and Kazmierczak, A. (2008). *An Ecological Framework for Greater Manchester.* Greater Manchester Ecology Unit for the Association of Greater Manchester Authorities. Available at: https://www.lancswt.org.uk/sites/default/files/2018-08/An%20Ecological%20Framework%20for%20Greater%20Manchester.pdf.

[26] Department for Environment, Food and Rural Affairs. (2019). Environment Bill summer policy statement: July 2019. Available at: https://www.gov.uk/government/publications/draft-environment-principles-and-governance-bill-2018/environment-bill-summer-policy-statement-july-2019.

IGNITION

IGNITION is an EU-funded project aiming to deliver innovative financing solutions for investment in GM's natural environment. It is focused on bringing to market solutions beyond the immediate term of those considered in the GM Environment Fund, and has collected an evidence base on the benefits of green walls, street trees, urban green space, green roofs and sustainable drainage systems (SuDS). The last of these – SuDS – is the concept currently being worked on, under which utility companies would install nature-based solutions that reduce water costs and then share the savings in the form of a partial bill reduction. In order for it to be viable, there needs to be a single bill payer across a number of sites – meaning that while it might be appropriate for the local authority estate, it is harder to launch in schools or hospitals, even though their aggregate footprint is very large.

While the original plan was to attract private investment, the fact that it is an unproven business model means that the first wave of projects may be funded by local authority borrowing. Furthermore, as one interviewee noted, the fact that much of the value is created in the form of co-benefits means that, 'It might make sense to turn to community funding/green improvement districts.' These challenges highlight the difficulty of mobilising private investment, but also show why public investment can play that mobilising role – by establishing an evidence base and building a business case.

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Financing options for GMCA and other city-regions in the UK and Europe

Financing the climate transition will require changes from multiple levels of government and the private sector. Without this, the transition will be all but impossible – 'The overriding issue is a lack of long-term consistent government funding,' as one interviewee put it. At a national level, with the full range of fiscal and monetary powers available, there are a plethora of ways in which governments can drive progress. The German KfW public development bank has played a key role in supporting the energy security and climate mitigation *Energiewende* policy[27]; Scotland has established a national investment bank to provide patient public finance for long term investments that create public value[28]; and IIPP research has explored how central banks could adopt a 'precautionary principle' to manage climate and nature-based risks[29]. While mobilising public finance is essential for the climate transition, various types of public funding come with different conditions and reporting requirements, requiring careful consideration to ensure the 'right' public finance mechanisms are being leveraged for the particular activity.

At the same time, there need to be changes in the financial system to unlock civic capital, i.e. capital that can be deployed for investing in the public interest at the city-region level. This will require changes to accounting systems to properly quantify shared threats (such as those posed by climate breakdown); new forms of taxation that capture spillover growth in private assets from community investment; new decision-making processes to enable greater democracy and participation; portfolio approaches that fund systems based on outcomes; new procurement mechanisms; and insurance that reflects the risks of the 21st century[30].

Although finance mechanisms are often posed as a binary between public or private measures, there are increasingly blended finance options that are being developed and deployed in a variety of contexts, including towards the climate transition. Blended finance aims to enhance the quality of partnership between the public and private sector by maximising mutualistic synergies. The types of large-scale innovative projects necessary to facilitate city-level clean growth missions, such as enabling deep retrofitting or decarbonising building heating across the entire city-system, are inherently filled with uncertainty and require mobilising large capital bases. Private financial

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[27] Mazzucato, M. and Penna, C. (2015). *The rise of mission-oriented state investment banks: The cases of Germany's KfW and Brazil's BNDES.* Available at: http://www.isigrowth.eu/wp-content/uploads/2015/11/working_paper_2015_1.pdf.
[28] Mazzucato, M. and MacFarlane, L. (2019). *A mission-oriented framework for the Scottish National Investment Bank.* Available at: https://www.ucl.ac.uk/bartlett/public-purpose/sites/public-purpose/files/mission-oriented-framework-for-snib_final.pdf.
[29] Chenet, H. et al (2019). *Climate-related financial policy in a world of radical uncertainty: Towards a precautionary approach.* Available at: https://www.ucl.ac.uk/bartlett/public-purpose/sites/public-purpose/files/iipp-wp-2019-13-climate-related-financial-policy-in-a-world-of-radical-undertainty-web.pdf.
[30] Beunderman, J. et al. (2019). *Building Civic Capital.* Available at: https://uploads-ssl.webflow.com/5ddbd6d8c8721f339f8284ef/5ea18eb53e44c4667e1cfebf_0411_Building%20Civic%20Capital%20(compressed).pdf.

models are not well suited for these types of ventures, because they may be too risky, achieve limited returns and may not produce returns for long periods. Similarly, city-level public finance does not have the amount of capital required to fund the climate transition alone. Blended finance helps extend the reach and effectiveness of both public and private finance, enhancing their impact and accelerating progress towards clean growth missions.

Without at least some of changes coming from national government and the broader finance system, city-regions will struggle to achieve their net-zero ambitions. They are, after all, one actor in a wider system – their success depends on the choices of others, just as their choices influence the behaviour of others. But whether or not they are being supported by other actors, city-regions can and should explore a range of financing options for climate action. This is a challenge many city-regions are currently taking up, and is one of the key themes of the work of the Healthy Clean Cities programme in Europe and the more recent Zero Carbon Labs programme in the UK. The learnings from the experiments in these programmes will be crucial for moving the city-level carbon finance industry forwards. This section outlines some of the financing channels that are open to city-regions. Climate finance is a rapidly evolving field; as such, this is not intended to be a complete list of all financing options.

However, the experience we have followed at GMCA shows that there may be a significant gap between the conceptual development of new approaches and their deployment – the options presented here are those that GMCA is already exploring, or could explore, in the next year as it seeks to bring more resource into its mission. While the list of options examined below could hypothetically be used to fund Greater Manchester's mission, careful consideration should take place to evaluate the legitimacy, alignment and suitability of each type of funding for the mission. There are five based on public finance and three on mobilising private investment.

Public finance options

Project-based grants

One option for city-region governments funding missions is to apply for funding from granting organisations on a project-by-project basis. This is how the vast majority of work within the mission is currently being financed in GMCA, according to interviews. As a result, there is a significant amount of time spent finding and applying for the grants. Even so, GMCA does not feel that they have as much time as they would like to commit to it. Grants for work in GMCA have come from BEIS, DEFRA and the EU – the UK's departure from the EU may make it harder to apply for some grants, depending on the nature of the final deal.

The advantage of funding climate action in this way, as outlined above, is that it matches money to need. Rather than thinking of the mission as having a fixed 'pot' to spend, it takes an approach of finding the 'right' funding sources for each new mission project. In theory, this could mean that the team feels less restricted in the type of work that it wants to pursue. However, as noted by one interviewee, it also means that projects have to satisfy other priorities, rather than just what is best for the mission, e.g. the requirements of the funder, which may not be mission-oriented, and may indeed have KPIs or other reporting needs which are opposed to the mission-oriented approach[31]. It may also mean that the mission orients towards established methods, for which there is more likely to be widespread funding available, rather than focusing on discovery and innovation. Additionally, if a large proportion of the mission is funded through project-based grants, there may be a tendency, or political pressure, to bid for projects that offer the most resource or highest profile, rather than focusing acutely on those projects that align strategically with the objectives of the mission.

Procurement in the GMCA Family

The GMCA Family, i.e. the affiliated public organisations, including the local authorities, the police and fire departments, and the health and social care services, have significant procurement power between them. The Mayor of Greater Manchester, Andy Burnham, recently argued that a key part of the COVID response had to be putting the Good Employment Charter at the heart of procurement services, in order to help people find good, secure jobs that pay a living wage and offer progression[32]. The same potential exists for supporting environmental work, whether this is through using suppliers committed to the net-zero goal, sourcing locally or providing a lead market for the rollout of retrofit.

Source: Manchester Evening News

A more sophisticated approach to accelerate procurement's ability to finance the mission would be through identifying the co-benefits[33] between climate work and other priorities, and engaging relevant stakeholders. For example, investing in better housing not only reduces energy use, it also improves health, something that has been made vividly clear in the COVID pandemic. In fact, one of the 10 local authorities in Greater Manchester, Oldham, has led by example here, with the NHS

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[31] Kattel, R., Mazzucato, M., Ryan-Collins, J. and Sharpe, S. (2018). *The economics of change: Policy appraisal for missions, market shaping and public purpose*. Available at: https://www.ucl.ac.uk/bartlett/public-purpose/publications/2018/jul/economics-change-policy-and-appraisal-missions-market-shaping-and-public.

[32] GMCA. (2019). UK's first Good Employment Charter Supporters' Network launched in Greater Manchester. Available at: https://www.greatermanchester-ca.gov.uk/news/uk-s-first-good-employment-charter-supporters-network-launched-in-greater-manchester/.

[33] Bachra, S., Lovell, A., McLachlan, C. and Mae Minas, A. (2020). The co-benefits of climate action: Accelerating city level ambition. Available at: https://6fefcbb86e61af1b2fc4-c70d8ead6ced550b4d987d7c03fcdd1d.ssl.cf3.rackcdn.com/cms/reports/documents/000/005/329/original/CDP_Co-benefits_analysis.pdf?1597064213.

part-funding the Warm Homes Oldham service that helps people struggling to pay their energy bills reduce their energy use and heat their homes[34]. Moving from siloed budgeting that prioritises statutory service duties followed by policy officers deciding what work needs to be done next to a more strategic cross-departmental budgeting model based on outcomes could thus open the door to the health service paying (or contributing towards) housing upgrades. This cross-departmental budgeting model would contribute greater personal capacity between public sector organisations to address challenges holistically and would enable public procurement to pool resources from across the public sector to finance missions.

Mission level budgets and funding experimentation

GMCA has committed some of its general budget to the mission as a whole, for example by creating a 'project manager for the mission-based approach' role within the organisations, and by providing some of the seed funding towards the Energy Innovation Agency. However, this funding is limited, and is likely to remain so given the financial strain GMCA (in common with almost all local authorities across England) are under.

The problem with this approach is that it leaves little room for flexible funding of experimentation and innovation. A core 'mission budget' is never going to be enough to pay for the widespread changes needed – for new energy installation, or nature restoration, or retrofitting. But the challenge for GMCA, as outlined in the *Government Powers* report, is to both scale up and roll out activity while recognising that further innovation is needed. One approach to this could be through Challenge Prizes – rewarding innovators who come up with new solutions. Nesta, which runs a series of social innovation challenge prizes, argues that they 'inspire new and better approaches to stubborn problems.[35]' The EIT Climate-KIC Healthy Clean City project, which funds cities running strategic experiments on climate action, is another example of flexible funding being used to fund innovation and learning. Sitra, the Finnish innovation agency, used challenge prizes to find ways to address complex problems in education and work over the course of a 2016-17 competition. Their research on the programme found that challenge prizes attracted new, qualified people to work on the problem and could support the progress of the entrants.[36]

Given that GMCA has its funding settlement set by the UK government, the ability to set mission level funding is dependent on negotiations and agreement. However, there may be other opportunities, for example, the EU's 100 Climate Neutral Cities by 2030 programme, part of the Horizon Europe mission.

[34] Oldham Council. (2020). Help to heat your home. Available at: https://www.oldham.gov.uk/info/200389/affordable_warmth/1979/warm_homes_oldham.
[35] NESTA. (2019). *Challenge prizes: A practice guide*. Available at: https://challenges.org/wp-content/uploads/2019/11/Nesta-Challenges_Practice-Guide_2019.pdf.
[36] Toivonen, T., Nordback, E. and Takala, V. (2018). *Sparking social innovation through challenge prizes*. Sitra Studies 133. Available at: https://media.sitra.fi/2018/10/22142645/sparking-social-innovation-through-challenge-prizes.pdf.

Value-sharing mechanisms

As pointed out by Laplane and Mazzucato[37], governments have historically socialised the risks of investments, while privatising the rewards. The 2008 financial crash was a perfect example of this, in which the banks that had made massive profits from risk investments were then given bailouts by the state, with little conditionality or guarantees of public value. For example, RBS made a record operating profit of £10.3bn in 2007, paying out an interim dividend of £953m in October 2007 and agreeing a final dividend of £2.3bn for June 2008[38]. In October of 2008, the government announced a £46bn bailout for RBS following the collapse of Lehman Brothers.[39] But in 2009, the bank still paid out £1.3bn of bonuses, despite making a loss of £3.6bn[40]. In total, the OBR estimates that the government spent £137bn supporting the banks, with Lloyds, Northern Rock, and Bradford & Bingley all needing critical government support[41].

GMCA's mission will inevitably involve significant investment and it could explore ways that it could share in the value it creates. There are at least two examples that it could look at in the near term:

First, the planned Energy Innovation Agency (EIA) will support the commercialisation of new innovations from the research pool of the universities and other local innovators. GMCA could take some equity in the projects that it supports, giving it the chance to earn a continued return on those businesses that go on to be successful. While initially the priority for the EIA will be to become self-sufficient, over the next five to 10 years there may be the opportunity to earn back more, if companies that it supports are able to scale and reach new markets.

Second, investments in nature and better green spaces in the city may lead to 'green gentrification', with property prices rising as areas become more desirable. For example, the High Line is an elevated garden walkway in New York and now a major tourist attraction. It cost $187m, was over 75% funded by the public and property prices nearby rose rapidly. The uplift for an apartment within 1km of the High Line was worth $67,000 per year[42]. Property taxes only captured a tiny value that the project contributed to – of the estimated $3.4bn of additional value created for properties within 500m, the government only received $103m. Exploring new ways to

[37] Laplane, A. and Mazzucato, M. (2019). *Socialising the risks and rewards of public investments: Economic, policy and legal issues*. Available at: https://www.ucl.ac.uk/bartlett/public-purpose/wp2019-09.
[38] Mor, Federico. (2018). Annual report and accounts. Available at: https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwjPtbPD2dLtAhWLiVwKHdK0BKk4ChAWMAR6BAgIEAI&url=http%3A%2F%2Fresearchbriefings.files.parliament.uk%2Fdocuments%2FSN05748%2FSN05748.pdf&usg=AOvVaw2gs_w1uG99o6PmhYPJZx-6
[39] Office for Budget Responsibility. (2019). *Economic and fiscal outlook*. Available at: https://cdn.obr.uk/March-2019_EFO_Web-Accessible.pdf#page=143.
[40] Treanor, J. (2010). RBS posts a loss of £3.6bn but defends £1.3bn bonus payout. Guardian. Available at: https://www.theguardian.com/business/2010/feb/25/rbs-3bn-loss-defends-bonuses.
[41] Office for Budget Responsibility. (2019). *Economic and fiscal outlook*. Available at: https://cdn.obr.uk/March-2019_EFO_Web-Accessible.pdf#page=143.
[42] Dark Matter. (2019). A Smart Commons. Available at: https://provocations.darkmatterlabs.org/a-smart-commons-528f4e53cec2.

Climate-KIC is supported by the EIT, a body of the European Union

share the proceeds from land value uplift may open up new revenue sources, as well as mitigating the impact of greening on less affluent residents of the city. In the UK, research from the Greater London Authority (GLA) looking at the effect of transport infrastructure investments argues that, 'Few taxes on existing stock are sensitive to increases in land or property values' and notes that it is particularly difficult to prevent value extraction in residential properties, as primary residences are not subject to capital gains tax[43].

Public wealth funds

Greater Manchester's mission has no dedicated budget to provide long-term stability and oversight. Given the financial strain GMCA and local authorities across England are under following the 2008-09 recession and now COVID-19, it is unlikely GMCA will have meaningful excess funding that can be allocated for the mission. However, Greater Manchester could explore the different models of public wealth funds, each of which are appropriate for different problems, scales and goals. Public wealth funds provide long-term value by helping to create businesses and in doing so develop markets that would otherwise not come into being[44]. Additionally, public wealth funds can create short-term value by curtailing the ability and willingness of debt-encumbered businesses to take risks, invest and expand in the process. The costs associated with developing public wealth funds now may be modest, particularly if government organisations fund them by borrowing at today's extraordinarily low interest rates.

Urban wealth funds are a type of public wealth fund that have been developed to add fiscal space and strengthen the balance sheet of public finances at the city level. Internationally, urban wealth funds have been effective vehicles, paying for housing without the use of taxes, as well as for infrastructure investments, including transport, education and health care[45]. Greater Manchester could, for example, utilise an urban wealth fund to consolidate its substantial ownership of real estate assets, pooling resources across the public sector, and undertake major infrastructure and development projects that align with the mission. In this case, a Greater Manchester urban wealth fund with a mandate to maximise public value could advance the mission's long-term aim of creating a large-scale retrofit market by increasing the demand side by using its credit access to directly pay for the initial costs of retrofit. This would stimulate the supply side of the retrofit equation, helping to build the market's necessary skills base and develop the local supply chains that would accelerate the retrofit market across the city-region, at which point new tax revenue would resupply the urban wealth fund's initial investment.

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[43] Transport for London. (2017). *Land value capture*. Available at: https://www.london.gov.uk/sites/default/files/land_value_capture_report_transport_for_london.pdf.
[44] Detter, D., Fölster, S. and Ryan-Collins, J. *Public wealth funds: Supporting economic recovery and sustainable growth*. (2020). Available at: https://www.ucl.ac.uk/bartlett/public-purpose/sites/public-purpose/files/final_pwf_report_detter_folster_ryan-collins_16_nov.pdf.
[45] Detter, D., Fölster, S., and Ryan-Collins, J. *Public wealth funds: Supporting economic recovery and sustainable growth*. (2020). Available at: https://www.ucl.ac.uk/bartlett/public-purpose/sites/public-purpose/files/final_iipp_policy_brief_11_public_wealth_funds_10_nov.pdf.

Mobilising private finance

Aligning with investors' climate strategies

As consumer pressure increases and there is growing recognition of the scale of the challenge we face, a range of investors may be willing to fund climate work that is in line with their priorities. One of the biggest opportunities is with pension funds – for example, GM Pension Fund, which is the largest local government pension fund in the UK and manages over 375,000 pensions, has committed to going carbon neutral. Its main focus is on moving money into low carbon or carbon neutral investments, increasing the money invested in renewable generation and using its shareholder influence to push companies in its portfolio to go carbon neutral. Other potential donors include impact investors, whose investments are 'made with the intention to generate positive, measurable social and environmental impact alongside a financial return,[46]' as well as philanthropic foundations and corporates.

Creating investible assets

Much of the innovation in climate finance is in creating new types of assets out of nature-based solutions. In order for them to be investible, they either need to reduce costs (for example, by improving energy efficiency), create value (for example, new parks that lead to house price increases) or meet regulatory requirements (for example, carbon trading schemes). This can have long-term structural change on investment markets. The US post-2008 Recovery Act provides an example of public finance actively de-risking and tilting the playing field in a green direction, as the stimulus provided high-risk, early-stage investment into renewables. It not only offered much-needed capital, but shifted the asset classification of renewables from 'unconventional' or high-risk 'energy' assets, towards more reliable 'infrastructure' assets, crowding in long-term institutional investors such as pension funds and insurers. [47]One potential barrier is creating the mechanisms to quantify, attribute and price benefits to draw in the widest possible range of investors. For example, increasing greenery in cities is good for reducing the heat island effect and trapping pollutants, but also for improving wellbeing, and greenery in office spaces has been linked to higher productivity[48]. But some of these benefits are public goods – non-excludable and non-rivalrous – and so impossible to invest in.

Municipal bonds

A municipal bond would allow local authorities to borrow money from new sources and potentially at lower rates than they can from central government. The investment company Abundance has opened a fund with West Berkshire Council, seeking to raise £1m to invest in solar powered

[46] Global Impact Investing Network. (2020). *What is impact investing?* Available at: https://thegiin.org/impact-investing/need-to-know/#what-is-impact-investing.
[47] See: https://www.iea.org/articles/green-stimulus-after-the-2008-crisis.
[48] University of Exeter. (2014). Why plants in the office make us more productive. Available at: www.sciencedaily.com/releases/2014/09/140901090735.htm.

energy. It's the first 'community municipal bond' in the UK and to date has raised almost £720,000. The practice is more established in the USA, where the first municipal green bond was launched in 2013 by the Commonwealth of Massachusetts[49]. They have been successfully used for a wide variety of projects – the most common use has been for water projects, especially flood defence. They have also enabled investment in transport, waste, land use and energy. They've also enabled large scales of investment - in total climate 'pure-plays' (bond-issuing agencies with more than 95% of their revenue from climate solutions) had over $14bn worth of outstanding bonds in 2018.[50]

This is clearly a nascent market in the UK and there are questions about the extent to which 'crowd-sourced' financing will be able to support climate action on the scale needed, especially in less affluent parts of the country, and during a severe recession resulting from COVID-19. Overall, though, it is a good opportunity to both raise money and build a stronger connection between the work of the mission and the local population, and one that GMCA could investigate further.

[49] Climate Bonds. (2018). Can US municipals scale up green bond issuance? Likely, 'yes'. Available at: https://www.climatebonds.net/files/reports/us_muni_climate-aligned_bonds_11-07-2018.pdf.
[50] Climate Bonds. (2018). Can US municipals scale up green bond issuance? Likely, 'yes'. Available at: https://www.climatebonds.net/files/reports/us_muni_climate-aligned_bonds_11-07-2018.pdf.

Reflections and considerations

To deliver its mission into the next year, Greater Manchester needs to focus additional attention on resourcing the mission and its activities. Despite the lack of centralised funding, GMCA has taken forward a number of mission projects primarily through project-based grants and mobilising the goodwill of stakeholders to support collaborative work on a pro bono basis. However, the current level of financing is insufficient to meet the scale of Greater Manchester's mission and will not be able to achieve success within the ambitious timeframe. Therefore, we recommend Greater Manchester consider the following:

1. Scanning the landscape: Financing Greater Manchester's mission will not require a binary choice of public or private instruments. Rather, the mission requires a mix of public, private and blended finance measures. It is crucial that GMCA prototype and identify the 'right' mix of finance needed to support innovation and scale action.
    - The initial steps in scanning the landscape might include engaging institutional investors such as the GM Pension Fund or local university pension funds to identify opportunities where mission activities and projects align with private investor climate strategies and social responsibility targets.
    - GMCA could undertake research to identify the city-region's debt capacity to take on different types of finance. Local government in the UK has access to historically low interest credit and GMCA should analyse if there are any strategic opportunities to access different types of finance that could accelerate the mission and shape the market, creating opportunities to crowd in or blend investment with other stakeholders.
    - GMCA could engage other public sector organisations, such as local NHS trusts, local authorities, and Greater Manchester Fire and Rescue to identify opportunities for their collective procurement decisions to accelerate new business development and direct the market towards the mission. Scanning public sector procurement opportunities could identify what activities within the mission should take place first.

2. Develop an umbrella vision to finance the mission: The CGs have successfully developed numerous mission activities and have begun delivering several projects. However, the CGs have largely avoided examining opportunities that may emerge from a holistic mission budget. Therefore, an umbrella vision should be developed and put forward between GMCA and key partners.
    - Developing an umbrella vision would identify, aggregate and synthesise the city-region's potential core mission funders from different sources. This could then be used to analyse synergies between different finance options, creating early opportunities to join up funding to accelerate impact. Furthermore, an umbrella

vision for financing the mission may illuminate where a central mission budget could be most effectively used to scale up action and direct the mission's budget to support initial activities where other forms of finance may not target investment.

- Various types of public funding come with different reporting requirements. Through developing an umbrella funding vision for the mission, GMCA could identify which types of public finance, along with their requirements, align or impede the mission, helping to determine what forms of public finance instruments could most effectively support the mission.
- Depending on the stakeholders involved in developing a collaborative umbrella funding vision, private sector finance could become mobilised more quickly and to a larger extent in support of the mission. If private finance were to be involved in the scoping process, the umbrella vision could ensure it is aligned with the investment community's climate strategies and create desirable investible assets, alleviating potential hesitancy or reluctance from private finance to engage in the mission.

3. **Undertake highly visible projects:** Greater Manchester's mission requires significant public and private finance. The mission would be well served by deliberately undertaking a high-profile project that could quickly build momentum in support of the mission. By successfully delivering a visible project, the public and private finance communities may become more interested in investing in Greater Manchester, a key outcome as financing clean growth will become increasingly competitive as more cities seek to take action.
    - Greater Manchester has recently generated significant political currency and attention that could be wielded to support highly visible mission activities. For example, the Mayor of Greater Manchester, Andy Burnham, had a high-profile dispute with UK Prime Minister Boris Johnson over a regional COVID-19 economic support package[51]. The Mayor gained significant political capital from the region's local leaders across multiple political parties and boosted his support from the local community. This political cachet could be invested towards the mission to explicitly develop the local green economy and support the city-region's COVID-19 economic recovery.
    - Successfully delivering a high-profile mission project would demonstrate to investors that Greater Manchester has the capabilities required to accomplish its vision. This could build private sector finance confidence, giving them the belief that investing in Greater Manchester will produce the forecasted returns, unlocking money for future projects.

[51] Nurse, A. (2020). The Conversation. Andy Burnham's standoff with London was always about more than just lockdown money. Available at: https://theconversation.com/andy-burnhams-standoff-with-london-was-always-about-more-than-just-lockdown-money-148594.

- Many cities and regions across the UK and Europe have made a commitment to climate action, with a recent estimate finding that three in four local authorities in the UK have declared a climate emergency and promised subsequent action[52]. There will become increasing competition for financing as more projects in support of the climate transition get underway and cities will need to differentiate themselves to attract funding. A highly visible project will help the city-region build its reputation as an innovator and early mover, making public and private finance want to invest in the mission, so they can become associated with Greater Manchester.

[52] Taylor, M. (2020). Council efforts to tackle climate crisis 'hampered by UK government'. Guardian. Available at: https://www.theguardian.com/environment/2020/nov/13/council-efforts-to-tackle-climate-crisis-hampered-by-uk-government.