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	E. / F. / H. PELICAN Year End Report
Summary/brief description of report	Report to record mission projects beginning the implementation and tracking phase, design mission 'feedback loops', and assess the impact of the PELICAN project in Greater Manchester at regional level
Date of report	14/12/20

Supporting documents: attach in pdf format

Year-end report: Making sense of missions in Greater Manchester

A report prepared for EIT Climate-KIC by IIPP

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

Institute for Innovation and Public Purpose (IIPP)

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 COVID-19 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.

Table of Contents

Welcome to the PELICAN year-end report

This report aims to explore how cities and regions can use mission-oriented policy to develop clean-growth roadmaps and take action implementing those roadmaps. This report is based on the experience of the Greater Manchester Combined Authority (GMCA), which is working towards its mission of 'Carbon neutral living within the Greater Manchester by 2038' adopted by the city-region in 2019[1] with design and research support from IIPP.

This report lays out the approach GMCA has taken to implement its clean growth mission roadmap in the year since its formal adoption, and the impact of engagement with the PELICAN project and IIPP as part of this work.

The report aims to build on the other reports submitted as part of the EIT Climate-KIC PELICAN project. Three of these reports took on key themes — Stakeholders, Finance and Levers — which were explored extensively in each report. This report supplements these thematic research findings, with an overview of three over-arching development areas that span the project.

1. **Understanding progress:** What type of implementation indicators and tracking measures could be developed to monitor the progress of Greater Manchester's clean growth mission that would support institutional and organisational learning?
2. **Feedback loops:** What might appropriate mission-feedback loops contain to monitor and evaluate mission activities, synthesise evaluation, and create opportunities to integrate learning into future mission activities?
3. **Measuring impact:** How has the mission-oriented approach, and the links to the PELICAN project impacted Greater Manchester's drive to innovation-led clean growth?

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

Executive summary

This report shows that the Greater Manchester Combined Authority (GMCA) has taken forward a relatively significant level of activity to implement its mission, despite providing modest resources and capacity. The city-region has demonstrated commitment to the mission in its first year of delivery at a high political level and within numerous individual organisations across different sectors.

Although some meaningful progress has been made, GMCA has provided little attention to evaluating the approach used to deliver the mission and support organisational learning. If the mission is to be successfully achieved, GMCA needs to develop learning pathways that can analyse where the implementation approach could be modified, and made more effective.

To support Greater Manchester in developing a robust mission evaluation and learning framework, we recommend GMCA:

1. **Understanding progress: Adopt a systematic approach** to understanding the progress made on the mission. GMCA has developed a complex apparatus to govern its mission. Furthermore, GMCA in collaboration with key stakeholders has facilitated numerous mission activities that are currently being measured and evaluated against a set of 21 priorities and 28 measures.

2. **Feedback loops: Create loops between mission activities, and the multiple governance structures that have been created under this mission.** We have developed a full-scale feedback loop model for Greater Manchester, to monitor three broad themes and ten dynamic indicators. Tracking these themes and indicators within an appropriate framework will help GMCA develop the agile capabilities needed to deliver the mission.

3. **Measuring impact: Take a dynamic approach to metrics.** The current KPIs being used to track the mission are predominately static and designed to evaluate linear progress. These are not well aligned with mission-oriented innovation theory — or with the non-linear unpredictable characteristics of the climate crisis — that suggest monitoring and analysis against dynamic appraisal indicators.

Understanding progress

The primary delivery mechanism that GMCA has developed to deliver the mission has been five thematic Challenge Groups (CGs). These CGs have brought together organisations from the public and private sectors, academia, NGOs, and community organisations to collaboratively develop and deliver programmes intended to help achieve the clean growth mission.

The CGs have strong representation from infrastructural organisations (such as United Utilities, Cadent, and Electricity North West), academic institutions (such as Salford University, Manchester Metropolitan University, and University of Manchester), charities (such as Lancashire Wildlife Trust, Cooler Projects, and City of Trees), and GMCA policy officers.

Over the past year, GMCA and the other active stakeholders have committed significant personnel capacity and some organisational resources through the CGs to begin the mission's implementation phase. As the mission moves into its second year of implementation, it is necessary for Greater Manchester to understand the progress it has made so that it can effectively improve implementation of the mission in the years ahead.

Understanding progress: assessment so far

During the first year of the mission's implementation, GMCA in collaboration with key stakeholders facilitated numerous mission activities. The impacts of these activities are being measured and evaluated against at set of 21 priorities and 28 measures (see *Stakeholder and Institutions Report*). The tracking indicators that GMCA is currently utilising are primarily quantitative, static KPIs that are best suited to evaluate iterative progress. Missions require dynamic appraisal and evaluation that is needed to measure progress towards non-linear tipping points and transformational advancements[2]. The tools GMCA is currently using to track the mission's progress and mechanisms to support institutional learning could be improved:

1. GMCA and its partners have dedicated their **collective capabilities** towards delivering Greater Manchester's clean growth mission, but we find that there has been relatively little capacity committed to developing feedback loops that could enable evaluation of past undertakings to learn, improve, and accelerate progress on the mission-oriented approach. During an interview a CG member stated, 'there is no process for capturing learning…within the membership of the group.'

[2] Mazzucato, M., Kattel, R., Albala, S., Dibb, G., McPherson, M. and Voldsgaard, A. (2020). *Alternative policy evaluation frameworks and tools.* UCL Institute for Innovation and Public Purpose. Available at: https://www.ucl.ac.uk/bartlett/public-purpose/sites/public-purpose/files/iipp-beis-alternative_policy_evaluation_frameworks_and_tools_oct_2020_final.pdf

2. There is a lack of emphasis on developing **reflective assessment mechanisms** evaluating how the mission-oriented approach is being implemented creates a potential risk that GMCA and its partners will not learn from their ways of working, ultimately missing critical opportunities to reach tipping points and facilitate the innovation necessary to achieve the long-term mission. Given the scale of Greater Manchester's clean growth mission and the obstacles to achieving it, feedback loops are necessary to design and embed. Therefore, we will take our learnings gained from observing the mission's implementation over the last year to identifying the crucial elements that Greater Manchester's mission feedback loops should consider later in this report.

3. During the first year of Greater Manchester's mission implementation phase, **stakeholder engagement and collaboration** has remained relatively static across the CGs and wider governance apparatus involved in the mission's oversight. Describing the membership of actors engaged through the mission's governance framework, one stakeholder recounted that "the people that are part of the groups want to actually deliver change and not just meet to have a chat. Those involved are very bought in but we don't have all the right people involved yet."

4. As we evaluated in the '*Refined Mission Roadmap report*', GMCA established five CGs that have been meeting regularly over the last year to undertake activities in support of the clean growth mission. The feedback loops and interlinks between these CGs have not been extensively developed. We would **recommend more engagement** between these groups, both bilaterally and multilaterally, as the project continues.

Feedback loops: a model developed for GMCA

We believe that if a series of feedback loops were to be created, they should identify, consider, and evaluate three broad themes that are significant to the success of Greater Manchester's mission: Engagement, Impacts and Limitations.

We identified these three themes as the foundation for Greater Manchester's mission feedback loop through an evaluation of IIPP's practice-based theorising of mission-oriented innovation policy and examining our wider experience supporting mission-oriented policy in a variety of contexts. In other settings where we have observed or supported mission-oriented policies being taken forward, some of these themes have also emerged as significant in tracking the progress of missions and identifying opportunities for improvement.

Greater Manchester's clean growth mission is ambitious and will require bold innovation to achieve its goal. Facilitating missions demands robust, agile institutional capabilities. One of these is the ability to dynamically learn and flexibility adapt to change throughout the mission's implementation. Feedback loops are a critical instrument that can support this form of learning that is needed to deliver missions. This learning capability is a present gap in Greater Manchester's mission that, if unaddressed, could impede the mission's implementation and lead to missed opportunities to accelerate progress. Speaking of the lack of evaluation capacity for the mission, one interviewee noted that currently "there is not much space for reflection and GMCA learning". Therefore, below we set out analysis and appraisal elements GMCA could include in a mission feedback loop to support the monitoring, evaluation and learning process needed to advance the mission.

In the table on the next page, we outline three themes and ten corresponding indicators that Greater Manchester could include in a mission feedback loop. The ten indicators were identified through a process of mapping IIPP's theory of mission-oriented innovation policy against Greater Manchester's hypothetical mission roadmap[3]. Evaluating each indicator in the feedback loop helps to identify if, how and to what degree activities taken forward by the CGs align with Greater Manchester's mission. The indicators can be evaluated against associated key considerations that reflect how actions within the CGs, and more broadly may support the relevant indicator and feed into the applicable theme.

[3] Mazzucato, M., McPherson, M. and Hill, D. (2019) *A mission-oriented approach to clean growth.* Greater Manchester Independent Prosperity Review. Available at https://www.greatermanchester-ca.gov.uk/media/1909/gmipr_tr_amissionorientedapproachtocleangrowth.pdf

Table 1. Potential themes and indictors for Greater Manchester's mission tracking and evaluation processes

Theme	Indicator	Key consideration	Exploring the themes
Engagement	Motivation	How and why did actors get involved in the mission	• Engagement examines how and in what ways the mission has diffused to key stakeholders beyond GMCA.
Engagement	Buy-in	What is the extent of the actor's contribution to the mission through the CGs	
Engagement	Shared vision	How well do actors understand the mission and see themselves affecting it?	
Impacts	Additionality	Have actors taken action through their organisation because of the mission and involvement in CGs?	• Impacts consider the different types of effects the mission has generated across GMCA and the engaged stakeholders.
Impacts	Penetration	Have actors changed behaviours within their organisations because of the mission and CGs?	
Impacts	Spillover	Have actors influenced the behaviour of others beyond their organisation because of their involvement in the mission?	
Impacts	Movement building	Have actors communicated their role within the mission and attempted to enroll others in the mission?	
Limitations	Obstacles	What are the barriers limiting actors from deepening their involvement in the CGs?	• Limitations refer to the impediments that may obstruct, slow or negate the mission's progress.
Limitations	Laggers	What is slowing the CGs' progress?	
Limitations	Bottle necks	Are there conflicts or clashing interests within the CGs?	

Deeper dive: Feedback model

In the following section, we highlight the themes and corresponding indicators that should be measured and evaluation through Greater Manchester's feedback loop:

Engagement: Motivation

- The actors engaged in the CGs do so voluntarily. To achieve this form of engagement, Greater Manchester's mission was carefully designed to be exciting to a broad swath of actors and inspire them to engage with GMCA on the mission. While the mission was not developed to appeal to any one particular set of actors, the mission must be perceived with excitement and broad appeal. Therefore, the feedback loop could monitor each actor's motivation for engaging in the CGs and assess the durability of those motives.
- Most of the CG members we interviewed noted that at least a part of their motivation to support the mission's implementation was for the altruistic opportunity to help accelerate the city-region's action on climate change. Additionally, the interviewees also noted other motives that supported their engagement in the CGs. For instance, one interviewee highlighted the mission represented a "prestigious project, exposure to the Local Authorities and universities, and [a way to] understand challenges Greater Manchester is facing". The lofty ambition of the mission and high-level profile it has in large part captures this motivation. Another interviewee described participating in sharing expertise and learning as a key motivation for engaging in the mission. This learning taking place in the CGs enabled the interviewee to "properly engage with the problems" that will support future business planning. By engaging in the mission's implementation, some actors were motivated to join the coalition of stakeholders crowding in experimentation and collaboratively shaping the direction of innovation, and hence, influencing future business pathways.

Engagement: Buy-in

- The mission cannot be achieved by one organisation or even a sector, as is the case with all missions[4]. If distributive ownership of the mission is to be achieved, actors need to develop a sense of buy-in that can facilitate action through the CGs and crucially within their organisations and networks. When actors feel a sense of buy-in and ownership of the mission, they will be likely to contribute to it and accelerate those efforts within their wider work.
- Cultivated shared ownership of Greater Manchester's mission is a challenging task. From our interviews with CG members, many actors developed buy-in to specific areas of the mission that

[4] Mazzucato, M. (2017). "Mission-oriented innovation policy: Challenges and opportunities". Available online at https://www.ucl.ac.uk/bartlett/public-purpose/sites/public-purpose/files/moip-challenges-and-opportunities-working-paper-2017-1.pdf

resonated with their work. For example, one CG member noted "the CG has tried to enthuse and support people to take it [the mission] into their own organisation to ask what more can we do — the social housing sector is seen as a place where that ownership can be motivating to do more in specific areas". As actors are able to buy-into and take ownership of the mission, they will become more likely to take actions that advance its progress. An actor involved in the Low Carbon Buildings CG described this stating "certain people have taken more ownership [of the mission]. The Retrofit Accelerator is a good example where people have invested into the mission".

Engagement: Vision

- The mission's shared vision encapsulates how well different actors understand the clean growth mission and see themselves, their organisations, and networks as affecting it. If actors are going to be motivated to engage in Greater Manchester's mission and developed buy-in for it, it is necessary for there to be a shared, collective vision of the mission.
- Actors should gain a common narrative of the mission's origin and build 'mission mystique' — a set of institutional-strengthening characteristics and charisma. A mission feedback loop should evaluate shared understanding and ensure opportunities throughout the implementation phase strengthen this collective knowledge as different actors are likely to join and drop out of activities continuously. Furthermore, a shared vision of the mission should also ensure actors see themselves, their organisations, and networks as having a crucial role in affecting it. A CG member identified this phenomenon beginning to develop sharing "there is social capacity in the [Challenge] Group that makes it work — you probably could not pick this up and dump it in another city". If actors see themselves as having a clear role and opportunity to affect the mission, they will be more likely to engage in the mission.

Impact: Additionality

- Whilst the engagement theme broadly assesses how stakeholders become enrolled in the mission, impact analyses the different forms of tangible outcomes that result from stakeholders engaging in the mission. Impact is primarily produced and facilitated through the CGs as the mission's main delivery mechanism. The theme of impact also has significance the 5-year Environment Plan Forum that to a lesser degree is a delivery body within the mission's governance framework.
- The factor of additionality could evaluate the actions that discrete actors may have decided to take internally in their organisations because of the mission and CGs. This is likely a potential long-term impact of the mission, making it essential for a mission feedback loop to assess additionality in a non-linear fashion to support tipping points.

- During an interview a CG member noted that they couldn't identify "an example of anything that would … have happened without the mission-based approach". The mission activities that are currently being taken forward, such as the Energy Innovation Agency or Retrofit Accelerator, would not have materialised without the mission-oriented approach and the collaborative partnerships it has fostered between organisations involved in delivery bodies, most notably the CGs (see *Refined Mission Roadmap report*).

Impact: Penetration

- Penetration examines how the mission has been mainstreamed within each stakeholder's organisation by analysing how their behaviors may have changed due to their engagement in the mission. Penetration is an indicator that has relevance to all of the bodies within the mission's governance framework.
- Whilst the CGs were primarily created as a mechanism to support experimentation, risk taking and collaboration, they were also intended to serve as a catalyst for spreading behavioral change in organisations across the city-region. As with additionality, penetration is likely to be an indicator that emerges slowly and may accelerate the mission's progress over time.

Impact: Spillover

- Spillovers are a third indicator within the domain of impact. IIPP has explored dynamic spillovers extensively throughout our development of mission theory[5]. Greater Manchester's clean growth mission calls for bold experimentation and risk taking to address 'the innovation gap' identified in the 5-Year Environment Plan[6].
- Through its mission-oriented approach, we would anticipate spillovers — unintended innovations that result from experimentation — to emerge through the activities of the CGs. A mission feedback loop could assess potential spillovers by evaluating how the actions of actors involved in the CGs support wider network influence. For example, this feedback loop indicator could evaluate how the actions of a stakeholder involved in the CGs have a wider impact on that stakeholder's customers, suppliers, competitors, and partners.

Impact: Movement building

- Achieving Greater Manchester's clean growth mission requires action from every organisation throughout the city-region. To deliver this level of widespread action, the mission-oriented

[5] Mazzucato, M. (2013). *The entrepreneurial state: Debunking public vs. private sector myths*. Anthem Press.
[6] Greater Manchester Combined Authority. (2019). *Environment Report 2019-2020*. Available at: http://media.ontheplatform.org.uk/sites/default/files/GMCA%20Environment%20Report%202019-20.pdf

approach needs to facilitate movement-building to support the mission. At the present early implementation phase of Greater Manchester's clean growth mission, building a movement has yet to materialise.

Limitations: Obstacles

- There is an infinite array of obstacles that may limit a stakeholder's ability to be involved in the mission, on a deep level or drive forward action. These obstacles could be practical such as a lack of time and funding, or structural and conceptual such as a lack of shared ownership and inefficient governance structures. As a member of the Greater Manchester Green City Partnership stated "there's not enough money to subsidise low carbon activities, but money is not the only issue." Understanding all of the many obstacles that may block progress is crucial for the mission feedback loop to evaluate.

Limitations: Laggers

- A mission feedback loop needs to evaluate laggers that might slow mission progress and can, in turn, support the development of procedures or activities to mitigate them. Laggers could range from practical challenges, for example the CGs have struggled to "facilitate small breakout groups online — in small groups there's lots of dynamic energy. There's a need for people to be familiar with the technology to run breakout groups virtually." Laggers could also be more abstract, the mission requires system-change and stakeholders need to develop a shared vision to achieve transformational action.

Limitations: Bottle necks

- . The CGs have been designed to bring a range of actors together to support the mission's implementation collectively. As is the case in any dynamic, collaborative process, actors supporting the CGs will find their interest complete, personalities could clash, and disagreements may spark interpersonal conflict. It important for these bottlenecks not to stagnate the mission's progress or damage the effectiveness of the CGs.

Feedback loops: theoretical approaches

Greater Manchester's mission is ambitious and demands technological, governance and societal innovations to overcome the present 'carbon gap' (see Appendix 2). Achieving the necessary innovations will require an open approach to learning that can be integrated into the mission's delivery procedures and mechanisms. A public policy 'feedback loop' is a learning mechanism designed to provide policymakers with a space to evaluate and analyse different forms of action that occur in response to or are influenced by complex inputs, including the policymaker's own actions[7].

Mission-oriented innovation policy positions policymakers to utilise systems thinking, taking actions that consider the connected whole rather than separate component parts[8]. Systems thinking calls for organisational and institutional learning to be support through robust feedback loops that have capacity to determine how a complex system behaves over time and responds to different types of inputs.

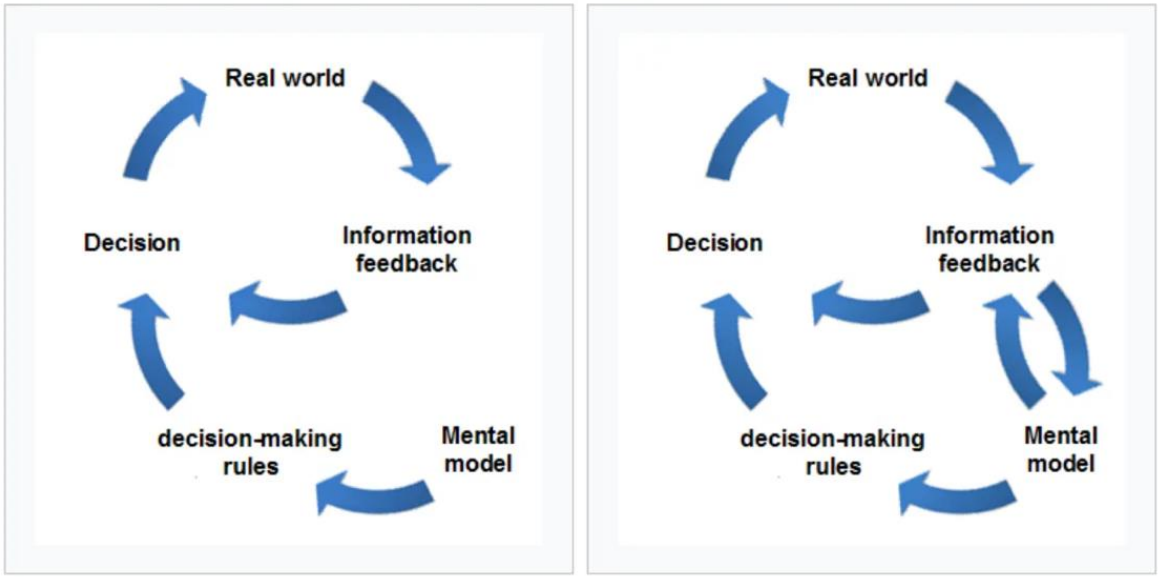
Greater Manchester will not be able to achieve its mission without developing and implementing robust feedback loops that can identify current gaps, enable learning, and accelerate innovation. Below we examine three examples of organisational learning feedback that Greater Manchester could build upon to track the process of their mission against the themes and indicators evaluated earlier.

Double-loop learning

Double-loop learning is a concept primarily concerned with facilitating organisational learning — a process of detecting and correcting errors — that focuses on how goals, targets, and decision-making rules can be evaluated and modified[9]. Single-loop learning, on the other hand, considers how organisations can make repeated attempts to solve the problems they may encounter attempting to reach a defined ambition. The way a problem or challenge is defined influences the approaches that are developed to solve it, potentially causing or being a source of issues that hampers an organisation to address the challenge. Double-loop learning recognises this conundrum by concentrating on the 'mental models' organisations use to make decisions, and examine the how these mental models might become more dynamic to drive innovation and creativity.

[7] Van Der Knaap, P. (1978). *Policy evaluation and learning: Feedback, enlightenment or argumentation?* SAGEG Publications. Available at: http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.955.3034&rep=rep1&type=pdf.
[8] Kattel, R., Mazzucato, M., Ryan-Collines, J. and Sharpe, S. (2018). *The economics of change: Policy and appraisal for missions, market shaping and public purpose.* UCL Institute for Innovation and Public Purpose. Available at: https://www.ucl.ac.uk/bartlett/public-purpose/sites/public-purpose/files/iipp-wp-2018-06_1.pdf.
[9] Argyris, C. (1977). *Double loop learning in organisations.* Harvard Business Review. Available at: https://www.avannistelrooij.nl/wp/wp-content/uploads/2017/11/Argyris-1977-Double-Loop-Learning-in-Organisations-HBR.pdf.

Figure 1. Single and double-loop learning processes. Source: Schön and Argyris 1996



The mission faces numerous challenges that it needs to overcome if delivery is to be achieved. This will require breaking through the current mental models of GMCA and the actors engaged in the mission implementation. To innovate requires healthy attitudes towards risk-taking and entrepreneurial experimentation. The mission activities currently lack these qualities, as one CG member noted "if we remain risk-averse and do what we've always done, we won't get there."

Developing and implementing double-loop learning mechanisms will enable Greater Manchester to critically analyse and assess the various mission activities and identify their weaknesses. Double-loop learning not only enables the evaluator to examine procedural inadequacies of a programme but also allows for scrutiny of the cultural practices or norms of those involved that may impede progress.

Organisational learning capabilities

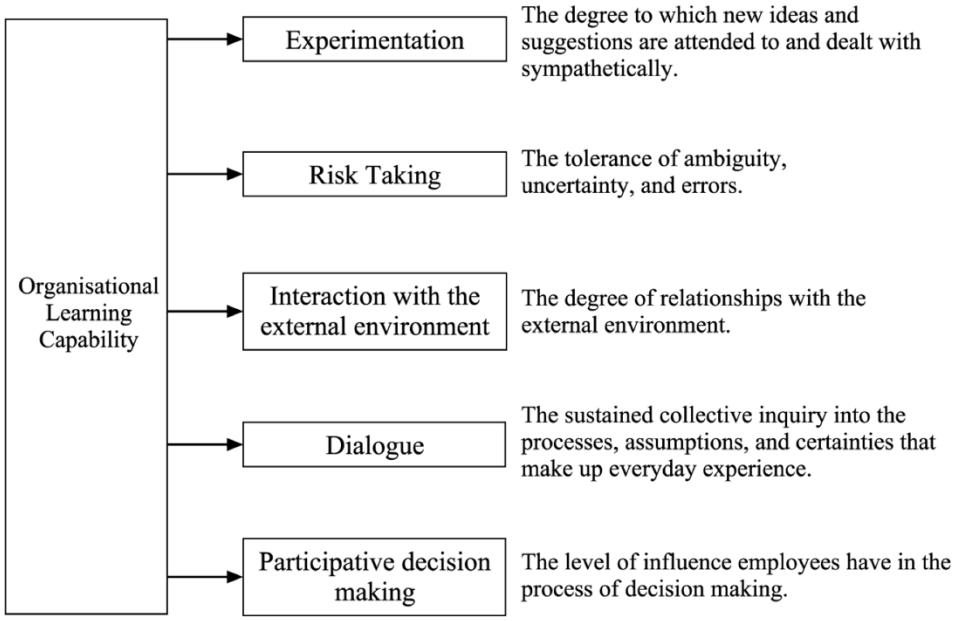
Organisational learning is broadly defined as the processes by which organisations learn. Facilitating this process requires organisational and managerial characteristics and capabilities that are developed over time[10]. These organisational learning characteristics and capabilities fall within five dimensions: experimentation, risk taking, interaction with the external environment, dialogue, and participative decision making. Public sector organisations can evaluate their organisational learning capabilities by

[10] Goh, S. and Richards, G. (1997) Benchmarking the learning capability of organisations. *European Management Journal,* 15(5):575-583. Available at: https://www.researchgate.net/publication/227416144_Benchmarking_the_Learning_Capability_of_Organisations

monitoring these five dimensions, in the process of identifying opportunities to improve their dynamic skills and abilities. GMCA will require significant organisational learning to achieve the mission and needs to invest in developing these capabilities.

This is a recognised weakness in the mission's current implementation framework as a GMCA policy officer noted "lessons aren't learnt … there's not much space for reflection and learning". Greater Manchester's mission feedback loop should be aligned with the dimensions of organisational learning and encourage GMCA and the other stakeholders to invest in improving their organisational learning capabilities.

Figure 2. Conceptual model of organisational learning capability. Source: Chiva, Alegre and Lapiedra 2007



GMCA should consider utilising this systematic approach as a foundation of the mission feedback loop, and investment in their organisational learning capabilities that are needed to achieve the mission. Organisational learning capabilities are dynamic, open to changes over time. Currently GMCA has dedicated limited capacity to developing these capabilities, though they acknowledge this present weakness is a gap which could impede the mission's progress. A GMCA policy officer noted "we need to start doing something on learning at a high level but don't have the capacity. We map evaluations at a project level but not the overall mission." Whilst GMCA does have limited capacity, where they invest those resources will be critical for the mission's success.

Gibbs' Reflective Cycle

Learning does not simply occur through the process of gaining experience. Without reflecting upon those experiences, it is likely learning potential may become lost. The thoughts and feelings that emerge from reflection have the potential to generate concepts or understandings, enabling experiences to rise above the mere perceived action of tactful, transmutable learning.

Gibbs (1988) proposed the 'reflective cycle' as a model for method reflection upon experience, to enable the introspective thinker to identify their strengths, areas for development and potential actions for improvement[11]. In the context of Greater Manchester's mission delivery, activities cannot be developed, implemented and evaluated for funders. GMCA needs to develop space for reflecting on mission activities so that learning can be extracted from actions and improved upon over time. When discussing the mission activities currently being taking forward, a CG member highlighted the importance of reflection, "I think it's not just enough to do what you think is the right thing … we need to reflect on the projects and change our approach." Whilst GMCA and the stakeholders engaged in the mission have begun to recognise the importance of reflecting on their actions, it is necessary for that reflection to take place within a structured process that can support learning.

[11] Gibbs, G. (1988). *Learning by doing: A guide to teaching and learning methods*. Oxford: Oxford Polytechnic

Figure 3. Model of reflective analysis. Source: Gibbs 1988

The first three steps of the reflective cycle (description, feelings, evaluation) emphasise analysing what occurred during the experience. The next three stages (analysis, conclusion, action plan) centre on evaluating how the experiences could have been improved and new outcomes could be achieved in the future. Generating learning from experiences using the reflective cycle can be done at the individual level or collectively as a group of larger actors.

Greater Manchester has recognised the need to develop and implement feedback loops that can identify the current gaps in its mission activities, enable organisational and institutional learning, and accelerate the innovation process. We note three missing feedback loops within the GMCA mission: between the CGs (and thus the linked Task and Finish Groups); between the CGs and the wider GMCA mission governance framework; and between the different elements of the GMCA mission governance framework. If these feedback loops were to be created and embedded, we would expect the mission activities and governance framework to be better able to support creativity, robust attitudes towards risk taking, and the development of dynamic innovation processes that are needed to facilitate tipping points and transformational advancements.

Measuring impact: the PELICAN project

The PELICAN project was designed to produce impact through Greater Manchester's mission-oriented innovation approach and generate new learnings that could be applied to other cities facilitating clean growth missions. When the project commenced, we intended to utilise a practice-based learning approach for the evaluation and theorising process by physically working with Greater Manchester and GMCA. However, the effects of COVID-19 required the project to observe and reflect upon the mission's approach remotely, demanding the PELICAN project adopt a modified process to our delivery plan for impact. Through the use of online engagement and communications tools, the PELICAN project team was able to participate in all of the formal activities we would have under pre-COVID-19 conditions. Utilising the available tools and technologies, the PELICAN project team were ultimately able to support impact as analysed below.

The most significant and noteworthy hindrance that the PELICAN project faced from being conducted remotely was the diminished informal contact the project team had with GMCA and the stakeholders engaged in the mission. Informal interactions before and after meetings and throughout the day whilst working in an office provide opportunities to build trust and generating deeper insights that can be used during the reflective process[12]. We attempted to cultivate space for these informal interactions through bi-weekly casual 'check-in' calls between the PELICAN project team and GMCA's project coordinator for the mission-based approach. Whilst imperfect, these informal discussions provided space for repour building and produced some impact as we evaluate below. Although the effects of COVID-19 require us to deliver the project differently than we initially anticipated, PELICAN nevertheless was able to produce meaningful impacts.

Evaluating the complete scope of impact generated from practice-based learning projects is challenging. Policy research and evaluation conducted alongside policymakers can produce specific impacts to policies but can also make more subtle impacts such as changing decision-making processes, develop new organisational capacities, producing new organisational models or even transforming social practices[13]. To evaluate the full scale of impact the PELICAN project has produced over the past year, we use Williams' (2018) 'integrated evaluation framework' that was specifically developed to analyse the effects and influences of researchers working in practice-based spaces (Figure 4). The integrated evaluation framework notes three 'orders of effect', moving from the practical impact to transformative change (see Appendix 3). As we evaluate below, the PELICAN project has produced notable first and second-order impacts on Greater Manchester's mission-oriented approach but has also achieved some third-order impacts.

[12] May, T. and Perry, B. (2017). *Reflexivity: The essential guide*. SAGE Publications Ltd.
[13] Williams, S. (2017). "Evaluating societal effects of transdisciplinary co-production processes: Final report." Available online at https://www.mistraurbanfutures.org/sites/mistraurbanfutures.org/files/Evaluating-societal-effects-Steve-Williams.pdf

Figure 3. Integrated evaluation framework: Impacts of the PELICAN project. Adapted from Williams 2017.

Orders of effect	Categories of effect		
First	*Usable products:* - Challenge Group observation reports - IIPP Challenge Group workshop - Greater Manchester Green City Region Partnership report	*Enhanced individual capacity:* -Learning exchange with GMCA mission-based approach coordinator - Bi-weekly capacity building discussion with GMCA mission-based approach coordinator	*Network effects:* - Advised GMCA's development of the Challenge Group strucutre - Connected GMCA to other organisations implementing mission-oriented innovation policy through MOIN
Second	*Policy effect:* - Project has aided develop of mission activities such as Local Area Energy Planning policy	*Organisational changes and action:* - 'Crowding in' of stakeholders through the misison has developed new business models and proejcts (Retrofit Accelerator, Energy Transition Region, Energy Innovation Agency, etc.)	
Third	*Alternative visions and imaginaries:* - Strengthening of 'mission mystique' has contributed towards a shared vision for carbon neutral living and collective purpose of stakeholders		

First-order impacts

- The PELICAN project produced several first order impacts. As illustrated in Figure 4, these impacts were achieved by creating usable products, enhanced individual capacity and network effects. The PELICAN project team developed usable products including observation reports evaluating the CGs activities and a learning and improvement paper for the Greater Manchester Green City Region Partnership[14].
- Through these products the PELICAN project team was able to reflect our analysis of the mission-based approach, demonstrating where activities strayed from mission-oriented

[14] McPherson, M. and Bellinson, R. (2020). *IIPP update on Greater Manchester's mission-based approach*. Greater Manchester Combined Authority. Available at: https://democracy.greatermanchester-ca.gov.uk/documents/s10991/GMCA%20IIPP%20Update%20on%20Greater%20Manchesters%20Clean%20Growth%20Misison%20D2.pdf

innovation theory and how gaps might be address. Our impact enhancing individual capacity mainly was achieved through supporting GMCA's mission-based approach coordinator, engaging them in a variety of activities to help develop their capabilities for managing the mission[15]. Lastly, we achieved network effects by identifying how the mission could be used to structure the CGs, engaging relevant stakeholders and through facilitating knowledge sharing activities in the Mission-Oriented Innovation Network (MOIN) where GMCA was able to learn from other organisations implementing mission-oriented innovation policies.

Second-order impacts

- There were several second-order effects that were influenced through the PELICAN project. Our work supporting Greater Manchester's mission has helped strengthen collaboration between GMCA and the stakeholders engaged in the mission, leading to policy effects such as the Local Area Energy Planning project[16].
- Furthermore, the activities and GMCA learning supported through the PELICAN project has helped align the CGs with mission-oriented innovation theory, strategically crowding in activity from stakeholders around the mission that has led to organisational changes and action including the development of the Retrofit Accelerator, Energy Transition Region, and Energy Innovation Company. Whilst these second-order efforts were not solely produced by the PELICAN project, our role has in part, enabled these impacts to develop.

Third-order impacts

- The PELICAN project was also able to support some third-order impacts. These impacts are more diffuse in comparison with the first and second-order effects but have the potential to make a long-term influence on Greater Manchester's mission. Through the PELICAN project, we have helped solidify and broaden 'mission mystique' in Greater Manchester. This has contributed to the shared vision for carbon neutral living, building the collective purpose of GMCA and stakeholders engaged in the mission. As with our second-order impacts, the PELICAN project was a key influence that has supported this impact rather than the exclusive factor that enabled this outcome.

[15] Institute for Innovation and Public Purpose. (2020). *IIPP continues its work with Greater Manchester to help the city become carbon neutral by 2038.* [Online]. UCL Institute for Innovation and Public Purpose. Available at: https://www.ucl.ac.uk/bartlett/public-purpose/news/2020/feb/iipp-continues-its-work-greater-manchester-help-city-become-carbon-neutral-2038

[16] Owen, S. (2020). *Local energy planning.* Greater Manchester Combined Authority. Available at: https://democracy.greatermanchester-ca.gov.uk/documents/s10008/7.2%20Local%20Energy%20Planning%20161020.pdf

The PELICAN project has impacted Greater Manchester's mission-oriented innovation approach in a variety of areas. This is despite the challenges and obstacles that were faced due to the COVID-19 crisis. These impacts highlight that the practice-based learning approach we have utilised has the capability to produce policy influences at a variety of levels while generating meaningful theoretical insights.

What's more, the practice-based learning approach has created some lasting impacts in Greater Manchester that will continue to influence the mission beyond the scope of the PELICAN project. The policy impacts and learnings have primarily affected GMCA but have also influenced the stakeholders engaged in the mission. Furthermore, the learnings and knowledge that have been realised, have begun to be disseminated with organisations engaged in mission-oriented innovation policy through IIPP's Mission-Oriented Innovation Network.

Conclusion

This Year-End Report for the year of 2020 in the PELICAN project has aimed to share reflections, analysis and recommendations across three key areas for mission-oriented innovation in cities and urban areas, with specialised application to the city-region of Greater Manchester.

We look forward to building on the research and learnings from this project, in order to continue to support both Greater Manchester, and cities and regions throughout Europe, in taking up mission-oriented approaches towards the green transition and post-COVID19 recovery, whether these missions centre on carbon neutrality, healthy living and wellbeing, mobility and greening industry, or the role that cities can play in hosting and promulgating green financial ecosystems. In particular, we look forward to further engagement with EIT Climate-KIC's Healthy Clean Cities Deep Demonstration, and to further sharing of resources and learnings – of both triumphs and challenges – for cities undertaking missions.

Appendix 1: A short introduction to mission-oriented innovation

Mission-oriented innovation is a new approach to innovation. It encourages governments 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[17]. Missions stimulate the development of a range of different solutions to meet grand challenges through actors being willing to take risks and experiment to identify innovative solutions. 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. They should inspire the public and attract cross-sectoral investment whilst remaining focussed enough to involve industry and achieve quantifiable success. Whilst 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 solutions to meet grand challenges by enabling actors who are willing to take risks and experiment.

Missions, unlike challenges, are more granular and involve framing and tackling specific, acute problems. They require multiple sectors to come together and collaborate in new ways. For example, climate change cannot be solved by the energy sectors alone but requires changes in nutrition, finance, and planning as well as many other areas[18]. An example of a successful mission is the 1969 Apollo moon program. The 'moonshot' mission was framed and set by US President John F. Kennedy in 1962 during his famous 'we choose to go to the moon' speech at Rice Stadium. The mission was set through a top-down vision but set a goal and timeline for bottom-up experimentation and innovation that many cross-sectoral actors were called to solve in getting a human onto the moon. The cross-sectoral collaboration required for the moonshot mission successfully achieved the mission's objective and created other innovations along the way, dynamic spillovers that galvanised growth beyond the mission.

The grand societal challenges we face today, including climate change, are more complex than going to the moon. Solving challenges like climate change requires attention to unpacking the interconnections between socio-economic issues with politics and technology, creating the need for smart regulation and demanding critical feedback processes across the entire innovation chain. Climate change and other societal challenges also need robust civic engagement mechanisms for enabling the public to participate, shape the innovation process and develop a sense of the buy-in for

[17] 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.* UCL Institute for Innovation and Public Purpose. Available at: https://www.ucl.ac.uk/bartlett/public-purpose/sites/public-purpose/files/iipp-wp-2018-06_1.pdf

[18] Mazzucato, M. and McPherson, M. (2018). *The Green New Deal: A bold mission-oriented approach.* UCL Institute for Innovation and Public Purpose. 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

the agenda along the way toward achieving a successful mission outcome. There are five criteria for the development of missions that address grand challenges, [19] and they should:

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

Cities and city-regions can be appropriate sites for mission-oriented innovation policies for several reasons. First, the local level of governance may be the most suitable venue to link the diverse range of actors engaged in missions from public, private, and civil sectors organisations to social enterprises to universities to citizens. As described above through the iParadigm findings, cities and city-regions may also be the nimblest level of governance, particularly supporting climate innovation, giving them the ability to support experimentation dynamically. Third, because public sector organisations at the local level are closets to the citizens and constituencies they serve, they are well suited to promote and advance public value — value created collectively for a public purpose. Furthermore, cities and city-regions are well-positioned to take advantage of local knowledge and local specialities whilst supporting experimentation and innovation processes. Whilst this is not an exhaustive list evaluating cities and city-regions suitability to design and support missions, these are several notable reasons that demonstrate why missions, including climate missions, are apt for the local level.

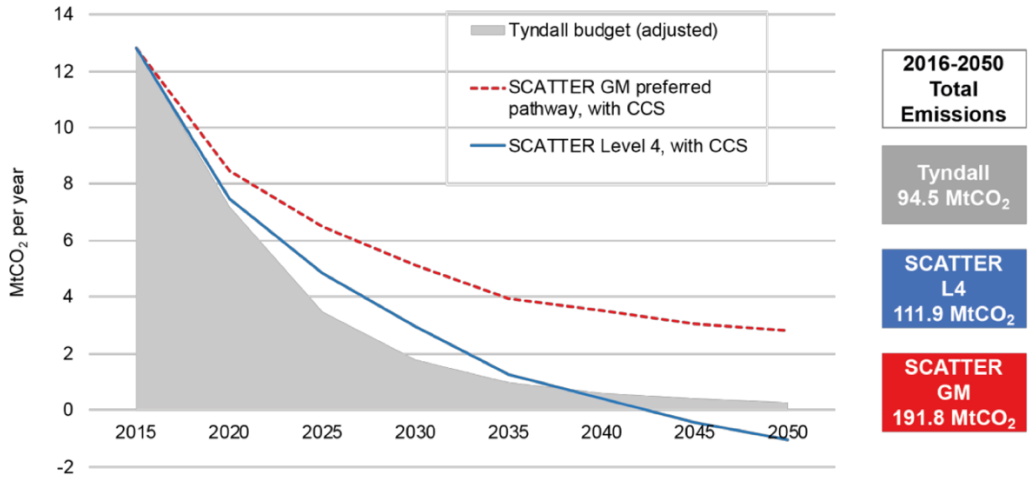
[19] Mazzucato, M. and Dibb, G. (2019) Missions: A beginner's guide. UCL Institute for Innovation and Public Purpose. Available at: https://www.ucl.ac.uk/bartlett/public-purpose/sites/public-purpose/files/iipp_policy_brief_09_missions_a_beginners_guide.pdf.

Appendix 2: 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°C increase above pre-industrial levels, with the ambition to limit the temperature increase to 1.5°C.[20] 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.[21] 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 depending on local decisions taken across over 40 different interventions, which can be implemented to 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 5: Potential carbon reduction pathways for Greater Manchester. Source: Anthesis



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

[21] Kuriakose, J., Anderson, K., Broderick, J. and Mclachlan, C. (2018). *Quantifying the implications of the Paris Agreement for Greater Manchester.* University of 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 ambition scenario, carbon neutrality is possible to achieve but 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.

Appendix 3: Integrated evaluation framework for societal effects of transdisciplinary research processes. Source: Williams 2017.

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