ClimateReadyClyde

Glasgow City Region Climate Adaptation Strategy and Action Plan

Annex 5: Portfolio Blueprint

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Resilient Regions: Clyde Rebuilt

Resilient Regions: Clyde Rebuilt is a project seeking to catalyse a transformational approach to addressing the impacts of climate change in Glasgow City Region. It is led by Climate Ready Clyde (CRC), a regional climate initiative made up of stakeholders from the City Region, with technical, cultural, economic and governance expertise from Sniffer which supports CRC. It also has cultural expertise and understanding of creative arts in sustainability from charity Creative Carbon Scotland, specialist climate change and economic expertise from research consultancy Paul Watkiss Associates and EIT Climate-KIC. The project is funded by Climate Ready Clyde's fifteen members and EIT Climate-KIC, Europe's leading climate innovation initiative. The project developed Glasgow City Region's Adaptation Strategy and a transformational adaptation portfolio blueprint.

EIT Climate-KIC's Deep Demonstrations

Unprecedented systemic crises threaten existing communities and future generations and will require urgent global action and collaboration. Regions are often responsible for (decentralised) resilience and adaptation planning and implementation, but they face multiple climate related shocks and stresses which affect their communities, landscapes and economies in different ways.

The need for climate adaptation and resilience strategies to address ongoing challenges, change the status-quo of 'reactive' climate measures and cope with more and increasing climate-related disasters, has given rise to the opportunity to focus on enabling and investing in climate resilience holistically.

EIT Climate-KIC's Deep Demonstrations accelerates learning about how to change the world in the context of urgency, diversity and radical uncertainty. They are inspirational examples of what's possible, have been designed to create a transformative impact and ultimately seek to achieve rapid systemic change, for the benefit of all citizens.

The *Forging Resilient Regions Deep Demonstration* works to accelerate the transition from climate-vulnerable to climate-resilient regions, where people, communities, and systems are able to withstand shocks and slow-onset stresses and transform into flourishing communities.

Contending that 'Business as usual' innovation is not delivering climate action fast enough, Deep Demonstrations use systems innovation to generate options and pathways for radical transformations. It starts with a demand-led approach, working with regional governments committed to fundamental transformation to a net-zero emissions, resilient future. It offers a fresh approach to innovation, combining research, entrepreneurship, education, policy, technology and sustainability, to maximise the potential for change in places and across value chains.

Deep Demonstrations involve an iterative, non-linear four-phase process of Intent, Frame, Portfolio and Intelligence.

The Deep Demonstration iterative process

In Intent, we listen to understand local or sectoral challenges and current commitments with regard to resilience and decarbonisation. We collaboratively develop the regional transformation vision through deep listening activities, workshops and interviews with government bodies, businesses and communities. By bringing together as wide an array of stakeholders as possible, we learn about what creates the fastest pathways to change in regions.

In Frame, we map out the relevant systems (which we want to transform) to identify where and how innovation can play a role in catalysing change. The outcome is a Portfolio Blueprint, with a series of leverage points that can address barriers and opportunities through innovation.

In Portfolio, we build and manage a portfolio of connected innovations designed to address the leverage points identified in earlier stages.

In Intelligence, we generate actionable insights and intelligence to inform decision-makers, provide feedback loops and accelerate learning about how to achieve transformation at scale.

Executive Summary

Current incremental adaptation is not delivering at the scale and pace needed to address the climate challenge. Efforts often fail to get to the heart of the issue, because adaptation sits within a wider economic, social and cultural system. A new urgency is required with more fundamental shifts away from technological solutions or improvements in infrastructure alone. To address this, Clyde Rebuilt takes a systems-based approach to transformational adaptation, aiming for deep-rooted change that allows Glasgow City Region (GCR) to adapt to climate change whilst bringing lasting benefits for communities. Clyde Rebuilt explores creative and cultural engagement, renewal of governance, and transformative finance as part of this process.

The purpose of this Deep Demonstration approach is to systematically identify a series of Innovation Actions, which, if activated together and proactively managed, have the potential to trigger this transformation. It builds on Climate Ready Clyde's vision and Theory of Change for a GCR that flourishes in a future climate and aligns with GCR's Adaptation Strategy.

The Clyde Rebuilt consortium, seeking innovation and transformation, has applied a locally bespoke version of the EIT Climate-KIC Deep Demonstration methodology that addresses systemic challenges and opportunities, embraces complexity and increases participation and influence over the process at all levels.

The starting point was a Literature Review on Transformational Adaptation which was used to discuss and agree the project framing approach. This was followed by a form of social network analysis and mapping of stakeholders in the City Region. The consortium also developed and employed a process of co-design. This involved developing and defining questions and leading discussions that explore a system with stakeholders, to identify their place in it and potential levers of change. The project has applied a systems approach, exploring creative and cultural engagement, renewal of governance, and transformative finance and how to apply these areas to seek innovation in transformational adaptation. Rather than rushing to solutions, the consortium has considered how innovation can bring about deep-rooted change.

The consortium itself, comprising specialists in innovation, economics and finance, culture and governance, is a microcosm of the world at large and its integrated and co-designed approach provides the foundation for this being amplified across the city region.

As well as ongoing exploration and inquiry with stakeholders as part of the Deep Demonstration methodology, the Consortium has pursued desk-based research, using the specialist knowledge from consortium members, as well as a review of existing projects from EIT Climate-KIC's Exaptive tool, and other resources.

The Problem Spaces that it identified are a representation of a broader system that presents tests of change and potential transformational adaptation. The two Problems Spaces identified, and the rationale are:

(1) **Extreme heat, seen through the lens of health and well-being**. This was chosen because this risk has not been considered in detail to date in GCR but will be important in the future. It also has an important linkage to the net zero transition, and requires system thinking because of the influence of the built and natural environment as well as the health domain.

(2) **Transformative adaptation financing**. This was chosen as a cross-cutting theme, to move away from a hazards-based approach.

For each of the two Problem Spaces, the consortium has identified a series of Positions (see below) which present the potential for a series of Innovative Actions, which could constitute a Portfolio.

Heat, Health and Well-being
Go where…
1. Local capacity builders have contributed to transformational change in their communities
2. Innovation within and across governance systems and structures
3. Data is codesigned and socialised for adaptation
4. Missing, marginalised actors have become mobilised and act as agents of change
5. The cultural sector has enabled civic change locally and in the region
6. Assets are defined and valued differently to create incentives for investing in the common good
7. Where community led activities and services connect with public sector services
8. Open and green space has been valued and invested in

Transformative Adaptation Financing
Go where…
9. Innovative combined mitigation-adaptation finance has supported transformational net zero and resilience projects
10. Major public adaptation projects have been financed with non-grant models
11. Transformative financing is supporting nature-based solutions
12. Public funds are being used strategically to leverage private sector financing
13. New de-risking instruments and/or models are being designed and implemented
14. The enabling environment for adaptation financing is being created
15. New system-based approaches are being used for sustainable finance

For the identified Problem Spaces and Positions, the consortium identified the research, projects and activities that have the biggest potential for innovation and transformative change. This Reconnaissance process has also provided the opportunity to learn from experience elsewhere and to help advance and inform the Problem Spaces and Positions.

The approach was underpinned by a number of design principles which were drawn from the parallel workstreams of Clyde Rebuilt, including the draft Adaptation Strategy, Literature Review, Theory of Change, Resource Mobilisation Plan and the Problem Spaces. The consortium co-designed a number of principles that it considers underpinning transformational adaptation, namely: multiple definitions of transformational adaptation exist, synergies with net zero, changing governance and thinking; it can be a messy process; explicit recognition of language and framing, need for scale and a structured, systematic process.

For each of the Positions related to the Problems Spaces, a number of Innovation Actions have been developed, as examples which the consortium advocate to be taken forward in GCR.

The result of the project work is the foundations that underpin an Innovation Portfolio for GCR which aim to accelerate the pace and scale of adaptation in line with Climate Ready Clyde's and EIT-Climate-KIC's own ambitions for Transformation, In Time.

The next stage will be to activate and implement the approach in conjunction with Climate Ready Clyde. This will involve:

- Creating the necessary enabling conditions for an innovation portfolio
- Resourcing and coordination
- Governance and reporting
- Funding and capitalisation of the portfolio
- Managing risk management
- Creating enabling conditions for scaling up of adaptation in GCR

The consortium will work with EIT Climate-KIC to ensure it has met the full set of criteria needed to launch the Innovation Portfolio and turn them into a portfolio of 30-50 projects, acting together, to bring about transformative change in GCR to ensure the region will flourish in the future climate.

Glossary of Terms

Blueprint, a plan that explains how to do or develop something.

Innovation Action, a way of learning and experiencing about possible solutions. It is a practical intervention (through projects, start-ups, technology developments, possible solutions, community initiatives, relevant relationships) that provides experiential learning – actions are not final solutions. An innovation portfolio is made up of multiple innovation actions, each providing different experiences and learnings from intervention.

Option, a way of understanding the value of the Innovation Action and evidence of potential solutions emerging from the portfolio. Options work as a steering mechanism for looking across the portfolio to identify interventions that offer transformational potential. The concept of an option will become relevant once we have portfolios of Innovation Actions and start to extract learning from them.

Problem Space, a representation of a broader system; an abstraction that enables Innovation Actions to be designed, tested and used to learn about catalysing systems transformation.

Position, where in the system (where in a Problem Space) can offer levers and catalysts for change – where to further explore to learn where and how to catalyse change at scale.

Portfolio Blueprint, setting out where to direct innovation and why, in order to bring about transformational adaptation across GCR, as a result of the reconnaissance phase, identifying the potential actions, supported by a pipeline of investment proposals, economic analysis and possible sources of financing.

Reconnaissance, our lines of inquiry, to explore and learn from examples of innovation elsewhere, searching for 'what' Actions and Options we could take in a whole system approach.

Please refer to the **Annex on Key Terminology Defined** for further definitions/descriptions of the Deep Demonstration terminology.

Contents

Deep Demonstration Introduction

a) Purpose of Clyde Rebuilt Deep Demonstration

Globally, Cities and Regions across the world are not adapting to climate change at the speed and scale required by our changing climate or the Paris Agreement (UNEP, 2018[i]). Recent stocktakes at the global (Chu et al, 2019[ii]), national (CCC, 2019[iii]) and local levels (CCR, 2019[iv]) identify that current efforts to adapt to the changing climate are small and incremental, or are often technocratic, treating adaptation as a direct response to an immediate problem (e.g. flood risk management). They fail to get to the heart of the issue, because adaptation sits within a wider economic, social and cultural system: a system which is often regarded as too complex to navigate and is often ignored as a consequence.

Clyde Rebuilt therefore takes a different approach, aiming for transformational adaptation**.** The Intergovernmental Panel on Climate Change (IPCC, 2014[v]), defines transformational adaptation as adaptation that changes the fundamental attributes of a system in response to climate and its effects, as compared to incremental adaptation, which are actions where the central aim is to maintain the essence and integrity of a system or process at a given scale. However, moving beyond this rather generic definition, it is clear that there is no commonly agreed definition in practice, i.e. it can mean different things to different people and communities of practice. Deliverable 10 of the Clyde Rebuilt project provides a detailed Literature Review, and a synthesis to define and understand transformational adaptation (Watkiss and Cimato, 2020[vi]). Based on this review and discussion, the project has then developed a working definition of transformational adaptation, set out in the box below.

> **What do we mean by Transformational Adaptation?**
>
> Transformational adaptation involves changing existing approaches, altering governance arrangements, and addressing underlying causes of climate risk or vulnerability. It may also involve re-thinking the future vision of the region, including the societal, cultural, institutional, ecological, and physical changes needed, as well as the region's political economy. Transformational approaches call for systems thinking and socio-institutional analysis, and offer the potential to deliver a larger, more sustainable, permanent, long-term change. Source Clyde Rebuilt (2020).

The aim of the Clyde Rebuilt project is therefore to implement this vision for transformational adaptation in practice. To do this, the project uses EIT Climate-KIC's Deep Demonstration method (Dunlop and Belle, 2019: Dunlop and Gollan, 2020).

We cannot achieve the vision needed for a Glasgow City Region (GCR) which flourishes in a future climate, or deliver transformational adaptation, by technological solutions or improvements in infrastructure alone. We need to find new ways of working. To do so the project has applied a systems approach, exploring creative and cultural engagement, renewal of governance, and transformative finance and how to apply these areas to seek innovation in transformational adaptation. This approach is mirrored in our project team and ways of working. The Clyde Rebuilt consortium involves a diverse and unique mix of expertise in place-making, resilience and climate knowledge-brokering (Sniffer), adaptation economics and finance (Paul Watkiss Associates) and

cultural practices and connections (Creative Carbon Scotland), and governance (all three) as well as systems innovation experience and insight provided by EIT Climate-KIC.

The purpose of this Deep Demonstration approach is to systematically identify a series of Innovation Actions, which, if activated together and proactively managed, have the potential to trigger this transformation. Some of these actions may be completely new and stimulated by this work, whilst in other cases, it is about helping align, crowd in and orchestrate existing work in partnership with others**.**

b) **Climate Ready Clyde's scope for innovation**

The challenges above, and the need for change, was recognised by Climate Ready Clyde (CRC) which, following initial discussions in 2019, sought to partner with EIT Climate-KIC to apply the Deep Demonstration methodology. To this end, Sniffer (in their role as secretariat to Climate Ready Clyde), GCR and EIT Climate-KIC signed a Collaboration Commitment, (dated 6.7.2020), as a formal statement of Intent to transform the region, in line with Climate Ready Clyde's emerging Theory of Change which sets out the future state and vision for the region that CRC wants to achieve. The full Collaboration Commitment is set out in Annex A, and this has been built on in 2020 through an agreement to pursue future funding together to implement the Portfolio Blueprint. The Commitment is strongly aligned to EIT Climate-KIC's own strategy 2019-2022 of Transformation, in Time[vii]. (EIT Climate-KIC, 2019)

Early in 2020, the Clyde Rebuilt consortium explored how the ambition of the project relates to Climate Ready Clyde, and the region's identity. The Clyde Rebuilt Literature Review of Transformational Adaptation (Watkiss and Cimato, 2020), Deliverable 10, was used to discuss and agree a project framing approach, including the initial boundaries for the definition of the Blueprint. These are summarised below:

- **Multiple, plural definitions of transformational adaptation -** we do not believe it is possible to produce a single overarching definition of transformational adaptation. However, our Literature Review suggested that the use of systems thinking, the level of change and the sustainability of the intervention, as well as having positive spill-over benefits are all hallmarks of transformational adaptation (Clyde Rebuilt, 2020).
- **Synergies with Net Zero** – an Innovation Portfolio should consider the net zero transition due to the policy landscape and potential synergies and trade-offs between the two. This is particularly important given the Scottish Government[viii] has committed to a target of net-zero emissions by 2045 and will adopt an ambitious new target to reduce emissions by 75% by 2030, and gas Glasgow City[ix] has announced a goal to be the UK's first carbon neutral city by 2030. There will be a net zero transition and it is important that this is made climate resilient, as well as providing potential synergies for transformation.
- **Changing governance and thinking -** to deliver more transformational change, there may need to be changes in governance or current thinking within the area of consideration, and potentially beyond.
- **A 'messy process'-** transformational adaptation is likely to be messy. It will involve a range of actions, which spans incremental to transitional change, as well as from the risk/sector level up to an overall system. This means individual actions are unlikely to be binary, i.e. neither incremental or transformational, but rather part of a spectrum. In this regard, transformational adaptation is likely to involve a combination of initiatives, some of which may be transformational on their own, and some which are incremental but combine to

acknowledge non-linearity, complexity and are more likely to enable transformational change as part of a portfolio of activities.

- **Explicit recognition of language and the framing** – the language and framing describing transformational adaptation can strongly influence the perception of action. For example, much of the literature defines transformational adaptation through the lens of social learning or governance. We accept that these should be activities to explore, as they could promote conditions for change, but we do not believe that all transformational adaptation has to have these attributes, i.e. we will avoid being too prescriptive.

- **Need for scale -** a transformational change should have scale. A set of transformational adaptation criteria will be used to assess regional adaptation options, but also as design and appraisal criteria for an Innovation Portfolio. The Literature Review identified a set of criteria, building on the transformational adaptation literature (Mustelin and Handmer 2013: David-Tàbara et al., 2018: Fazey et al., 2018: Fedele et al., 2019: Pal et al., 2019: Zografos et al., 2020[x]).

- **A structured, systematic process** - it is possible to develop a systematic process for transformational adaptation, centred around the EIT Climate-KIC Deep Demonstration method, which includes varying tools and techniques. For GCR this includes a transformative vision, developed through a Theory of Change, Deliverable 1, to guide action, the use of systems approaches and criteria-based approaches which emphasise transformation, as well as the use of cultural practices.

1.1 Method (What you should be working with from Intent)

A number of key methodological elements for the blueprint are set out below.

Mapping of Stakeholders and Co-Design Process

The Clyde Rebuilt consortium, seeking innovation and transformation, has applied the EIT Climate-KIC Deep Demonstration methodology, undertaking a process of discovery and collaboration both within the team and through our broader engagement, avoiding rushing to solutions. Applying this co-designed process, the consortium has been able to challenge, interrogate and explore potential levers of change and systems thinking within the systems that operate within and beyond GCR.

One of the early steps in the Deep Demonstration method - as part of the Frame stage - is the identification of key stakeholders to be engaged through the process (see Miro Map, Fig 1 as part of the Reconnaissance Report, Annex B).

Clyde Rebuilt goes beyond a traditional stakeholder engagement approach and has integrated a co-design and co-production approach. This was based on a review of the adaptation co-design literature, see box above.

Co-Design and Co- Production

One of the key aims of Clyde Rebuilt is to co-design a transformative adaptation strategy and Innovation Portfolio for GCR. Co-design (cooperative design) is the participatory design of a project with stakeholders (the users of the project outcomes). The aim is to jointly develop and define questions that meet collective interests and needs. This can then lead to the participatory development and implementation of a project with these same stakeholders, known as co-production or joint knowledge production.

A review of the co-design literature was undertaken to develop an approach for the project. This focused on existing reviews and guidance (Beier et al., 2016: Groot et al., 2014: OECD, 2016[xi]). The focus for Clyde Rebuilt (based on the approaches outlined by Harvey et al., 2017[xii]) was decided to be on a Brokered process (using intermediaries or knowledge brokers who help to mediate the process), and Emergent co-design process (critical/reflexive or descriptive) to encourage new transformative ways of challenging existing thinking and narratives. The co-design approach drew on factors for successful co-design for adaptation (Hegger et al., 2014: Watkiss et al 2018[xiii]), and thus Process orientated, Objective and outcome led, User and decision orientated, Joint product orientated, Iterative, Transparent and inclusive. This was more challenging to implement due to COVID-19, and the need to hold all co-design through virtual workshops, but new approaches were used to encourage more exploration with visualisation approaches.

The approach used methods including 1-1 interviews, focus groups, and workshops. The project used innovative approaches to these (e.g. with the use of culture, visualisation exercises) and also expanded beyond the usual technical stakeholders (on climate change) to hear new and different voices. It also used the early political economy work provided by E3G as part of the EIT Climate-KIC programme to help identify stakeholders and their influence.

Developing systems thinking

One of the common themes around definitions of transformational adaptation is that it involves changes at the system level. It therefore can be aided by systems analysis (also often called systems thinking or systemic analysis).

Systems thinking offers a way to identify improved policy solutions for complex and multi-objective policy issues (Stewart and Ayres, 2001[xiv]). Such approaches can provide a better representation of a complex system, and they allow decision makers (or problem owners) to see the bigger picture and to identify underlying drivers of vulnerability or key leverage points. They therefore offer more potential to develop innovative or integrated (cross-cutting or cross-sectoral) solutions, which would be typically associated with transformational change.

In practice, systems thinking often involves: i) identifying and mapping the system of interest; ii) exploring and understanding its components and connections; and iii) eliciting potentially very different stakeholder and Challenge Owner perspectives, then iv) exploring possible intervention points. The initial step is important to make the analysis manageable (otherwise the complexity becomes too great), i.e. to define where the system starts and ends. The next step is to build up an understanding of the system, including connections and inter-relations. This requires a multi-disciplinary approach, combining multiple information sources, and can be facilitated with system maps, or even more formal modelling methods. For Clyde Rebuilt, the focus was to develop systems maps.

The next step is to explore possible intervention points that can lead to systemic change, in this context for transformational adaptation. This also requires understanding the perspectives of the actors in the system and the governance arrangements around decisions. A complementary tool that is often used alongside systems thinking for this is Social Network Analysis. This analyses social networks and institutional actors (organizations, individuals, interest groups, etc.) and their linkages (socio-institutional relationships), mapping the influence and the exchange of information to assess adaptive capacity (Bharwani et al., 2013[xv]). This explores socio-institutional processes, and thereby identifies the context and governance around decisions, including institutional arrangements and structures. EIT Climate-KIC has also produced a handbook for the design and implementation of participatory system mapping processes addressing system innovation (Matti et al., 2020[xvi]). We have applied a form of Social Network Analysis in the project. Social Network Analysis is often used to support systems-thinking, as it can help identify governance regimes or changes that can deliver more holistic and transformational solutions.

Application of the method

This Portfolio Blueprint applies the Deep Demonstration method, and the co-design, systems thinking, and social network analysis outlined above.

We have applied this approach to two Problem Spaces – extreme heat, seen through the lens of health and well-being; and the challenge of financing adaptation. We have developed a working method, as a project consortium and with partners as diverse as private financiers, public bodies and small, community-based cultural organisations, which can be applied in the next phase across more Problem Spaces.

This deliverable presents our system maps for two Problem Spaces and identifies some Positions: potential points of intervention by which beneficial and transformational changes to these systems could be achieved.

1.2 Problem Spaces for Climate Ready Clyde

The EIT Climate-KIC method seeks to identify Problem Spaces: these are a representation of a broader system that presents ground for tests of change and potential transformational adaptation.

Climate Ready Clyde had previously completed a GCR Climate Risk and Opportunity Assessment[xvii] (GCR CROA) (CRC, 2018) which had identified approximately 62 risks and opportunities in the region, split across six themes. However, this had not applied systems thinking or the Deep Demonstration method and was thus focused on informing incremental adaptation.

The Deep Demonstration approach recommends focusing on a small number of major Problem Spaces. However, as found in the GCR CROA, there are a very large number of possible themes to consider in the Deep Demonstration Pilot. For Clyde Rebuilt, two areas were selected.

A decision was made early on, in discussion with stakeholders, to apply the Deep Demonstration method in a less-understood climate risk. Most of the historic focus on adaptation in GCR has been on flooding, a climate risk with a complex and crowded existing political and governance landscape. It was decided that a novel approach, applying systems thinking, might therefore work better and get more buy-in, in a new area. **The first area selected was therefore around heat, health and well-being**. This was chosen because this risk has not been considered in detail to date in GCR but will be

important in the future. It also has an important linkage to the net zero transition, and requires system thinking because of the influence of the built and natural environment as well as the health domain.

The second area chosen was a cross-cutting theme, to move away from a hazards-based approach. There are several potential themes that could have been considered, but early work on adaptation for CRC (Watkiss et al, 2019[xviii]) identified the importance of finance, both as a precursor for incremental adaptation, but also the need to develop new ways of attracting and leveraging finance. **The second area was therefore on transformative adaptation financing**.

Problem Space 1: How GCR responds to future high temperature and heatwaves will depend upon the systems that support health and well-being of people and communities.

Description: Temperature and extreme heat is an emerging climate hazard and set of risks and opportunities for GCR. The latest UK climate projections (UKCP18, Low et al, 2018[xix]) indicate that extreme heat is likely to be greater risk for the UK than previous projections (UKCP09), and new work in Scotland (Undorf et al, 2019[xx]) that has downscaled the new UKCP18 data to Southern Scotland, indicates a higher heat wave frequency. This indicates a heat wave on average, every other year, by the 2050s.
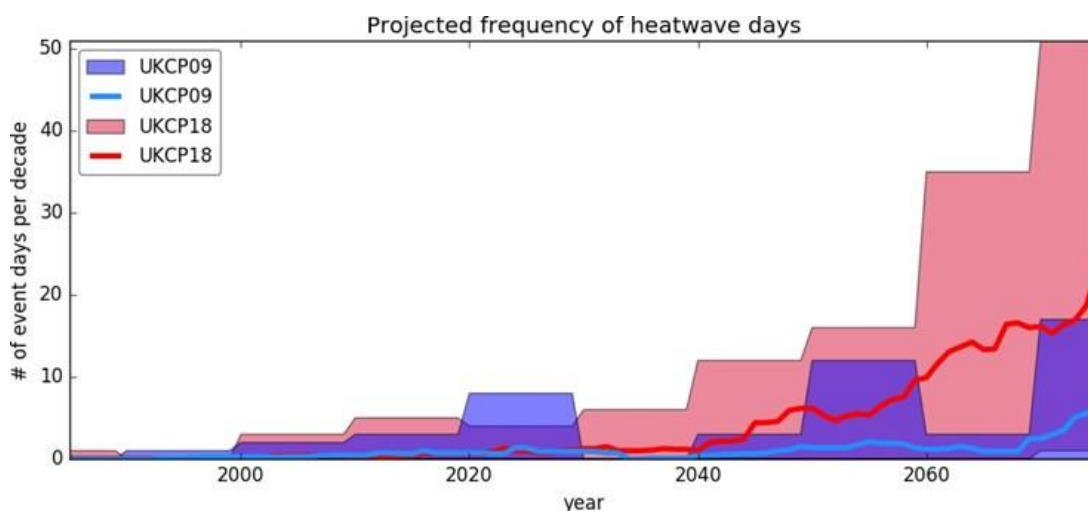
Figure 1: Future number of heatwave days[xxi] per year as projected by the (red) UKCP18 datasets for Scotland, versus the previous projections (blue) UKCP09, with wider envelope showing the range.
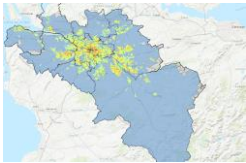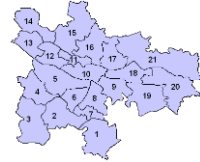
However, because of low historical exposure to heatwave, GCR has not considered these hazards in detail to date.

This means extreme heat offers a greater opportunity for new analysis and is a large adaptation gap, with so far little understanding or awareness of the risk it represents. It is also a system which is likely to emerge over the next decade, meaning it offers great potential to shift the trajectory from an incremental approach to a transformational one.

Health and well-being have also emerged as an engaging and cross-cutting theme. Well-being is a national theme for the UK and Scottish Governments (SG, 2015[xxii]). Well-being underpins all aspects of individuals' experience of their life. It is broader than physical health, and extends to cover mental, emotional, social and physical health, and a comparison of life circumstances with social norms and values. It includes subjective well-being, i.e. with respect to how individuals think and

feel about their own well-being, as well as objective well-being, which is based on human needs and rights, including aspects such as adequate food, physical health, education, safety etc. By targeting well-being, rather than health, the analysis takes a broader systems approach. This is because multiple facets are associated with well-being.

It is also recognised that both health and well-being, need to consider a systems perspective, including the different aggregation levels and inter-linkages and the different sectors involved. These are shown below. In summary, to deliver transformational adaptation in the heat, health and well-being domain, both the hazard (heat) and well-being (the combination of vulnerability and adaptive capacity) need to be considered at multiple scales, as part of an overall system approach.

[xxiii]Aggregation Level	Heat (hazard)	Well-Being
Region	Regional climate (average and peaks) For GCR – additional factor of the heat island effects	Regional factors - social, economic and cultural environment, distributive justice and procedural justice
Local	Local climate influenced by local topography, land-use, etc.	Local factors- - social, economic and cultural at community level
Building	Indoor climate influenced by building design, insulation, etc.	Local factors for health and well-being - access to services, green space
Individual	Individual exposure to temperature influenced by behaviour, etc	Individual determinants e.g. income, education, employment, age, sex, race/ethnicity

The next step in this problem framing was to look at the system-wide implications of heat on health and health/well-being. A number of systems that support health and well-being are threatened by changes in temperature. An initial mapping was undertaken, which drew on the existing Climate Ready Clyde's work on climate risks and opportunities (CRC, 2018) on individual risks and actors, and developed these into a combined overall system diagram. This also drew on the wider literature on heat pathways (Kingsborough et al., 2016[xxiv]: Mendizabal and Peña., 2017[xxv]). This is shown below for extreme heat, illustrating the cascade and interactions.

Extreme heat
Emergent properties of the mal-adapted system
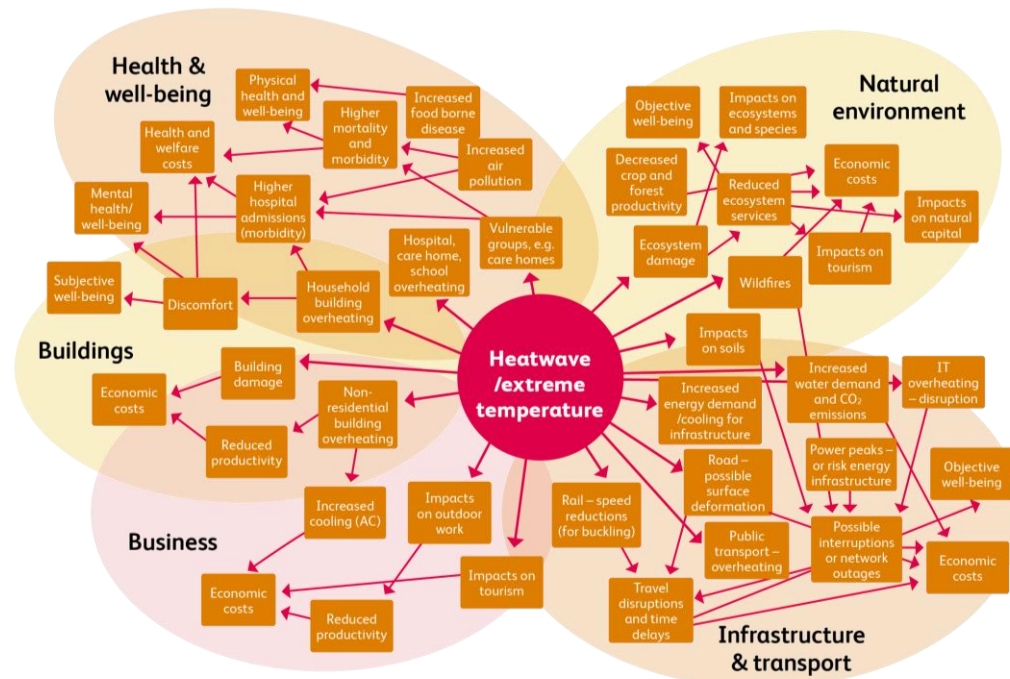
Figure 2: System-wide Implications of Heat on Health and Health/Well-being. Source Clyde Rebuilt.

This analysis highlighted a very strong inter-connection between many substantive (and wider) issues including: housing/building stock (existing and future), land use, nature-based solutions, air quality, agriculture, cultural connections, community empowerment, infrastructure etc. In particular, the analysis identified that tackling the issue of heat was likely to require integrated solutions across the health, buildings and land-use domains.

There is also a very important linkage to the mitigation domain with this theme, because of the linkages with buildings and green space. As highlighted above, the Scottish Government has committed to a target of net zero emissions of all greenhouse gases by 2045 and also set out that it will adopt an ambitious new target to reduce emissions by 75% by 2030 and has an ambitious Climate Change Adaptation Programme. Glasgow City Council has announced a goal to be the UK's first carbon neutral city by 2030 following a decision of the council's City Administration Committee.

This will mean a complete transition of the city's building stock to zero carbon energy. This is critical because temperature is one of the major drivers of energy demand in the UK, for winter heating for both the residential and service sectors. Scottish Energy Statistics (2018[xxvi]) show that heating dominates household energy demand and this is predominantly supplied by gas (average domestic gas consumption per consumer was 13,443 kWh/year for Scotland). The net zero transition will involve reducing energy demand – through design and insulation in the short-term – as well as fuel

switching in the long-term term, to electricity (powered by renewables) or hydrogen (CCC, 2019[xxvii]). However, there is a real danger of locking in over-heating risk if this transition does not consider climate change. Indeed, many UK homes are already at risk of over-heating from high temperatures (ASC, 2014, CCC, 2019[xxviii]) and the design of low carbon houses is still centred on managing winter heating demand and could thus exacerbate summer over-heating. Similarly, there are synergies between net zero, green space and urban cooling.

The next step was to explore possible intervention points that can lead to systemic change, in this context for transformational adaptation. This also requires understanding the perspectives of the human actors in the system and the governance arrangements around decisions. To explore this, a number of workshops were held to undertake social network analysis mapping. An example of the resulting social network map is shown below for the heat, health and well-being example.
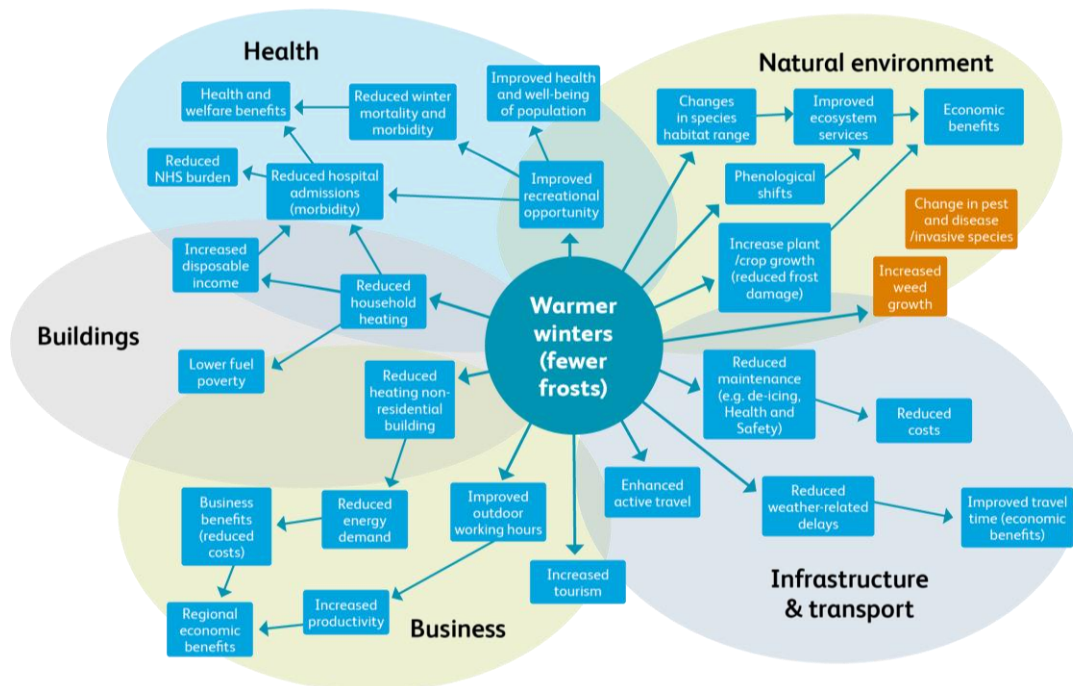
Figure 3: Social Network Map for Heat, Health and Well-being, Clyde Rebuilt Workshop Oct 2020

The key findings from the system-based analysis and social network mapping are that the heat, health and well-being space is complex, and that to address problems there will need to be collaboration (integrated solutions) from the health, built environment and land-use planning domains (and actors within these).

There was also a strong potential synergistic link with the new zero transition, and from this, a need to ensure a climate resilient net zero transition is facilitated in GCR or, to put it another way, it does not make sense to transform the system twice – once for mitigation and once for adaptation.

Finally, the consideration of temperature more broadly – rather than just extreme heat – highlighted that there is a potential benefit to GCR from rising temperatures. Analysis from the CRC report and underlying studies estimates that even by mid-century, there could be a 15-25% reduction in winter-related energy demand in the region. This is an extremely large benefit when expressed in economic terms (CRC, 2019), potentially of around £100 million/year for the region. This would also have wider health outcome benefits.

Figure 4: Benefits and opportunities from warmer temperatures. Source Clyde Rebuilt.

These opportunities are highlighted because they could help inform – and even fund – the overall transition to a climate resilient, net zero pathway. They also highlight many important co-benefits that could be delivered by a more integrated and joined up systems solutions, i.e. thinking about the opportunities for green space in terms of benefits, as well as reducing extreme heat effects.

Relevance to EIT Climate-KIC: Given the related themes, this Problem Space is very relevant to the work of EIT Climate-KIC and is a good strategic fit, while also relevant to EIT Health-KIC. With accelerating changes in the climate, it is likely to be a systemic challenge for all regions across Europe and requires myriad new and innovative solutions. It is relevant to many of EIT Climate-KIC's Deep Demonstrations including, Healthy Clean Cities and Landscapes as Carbon Sinks. It offers huge scope for innovation and systemic approaches, making EIT Climate-KIC a relevant organisation to work within this space, along with many of EIT Climate-KIC's cross cutting partners.

Other funders and players:

The broad scope of this Problem Space indicates that there are a large and wide number of organisations, agencies and potential funders for whom this is relevant. Ranging from the NHS, Scottish Environmental Protection Agency, Local Authorities, community organisations, Scottish Land Commission, Housing Associations, States of Change, IIPP, Greenspace Scotland etc. Please refer to Figure 3 above for an example of the stakeholder mapping, and also Figure 1 in the Reconnaissance Report, Annex B. As indicated in Next Steps, Section 1.7, the potential for innovation in this area has generated interest from the Scottish Government, in particular Clyde Mission as possible sources of funding. Equally, given the central role of creative arts and cultural practice, we are keen to explore potential support from Creative Scotland.

Problem Space 2: Insufficient public funds, lack of innovation and absence of models and instruments that encourage private sector investment has created an adaptation finance gap across GCR preventing regional transformation.

Description.
The availability of finance is an important constraint to adaptation. Globally, there has been a major uplift in climate finance flows for mitigation in recent years, reaching approximately $579 billion (CPI, 2019[xxix]). However, global climate finance flows for adaptation were only US$30 billion/year in 2017/8. This issue is also reflected at the national and regional level. Climate adaptation plans have not been widely implemented across the UK (CCC, 2019) and finance has been focused on one or two areas only. In Scotland, some major funding schemes have been announced, but these measures are focused mostly on mitigation to help the transition to net zero by 2045.

The reasons for this relate to the differences between mitigation and adaptation. The increase in mitigation finance has been triggered by the development of renewables and low carbon technologies, and by investment by the private sector (CPI, 2019) – indeed, more than half of the global flows of mitigation investment are from the private sector.

This can be contrasted with adaptation. Almost all of the finance flows from adaptation (CPI, 2019) are funded from the public sector (although data on private adaptation finance flows are poor). Moreover, there are less obvious financial returns on adaptation resulting in challenges around the generation of income streams for private investment (UNEP, 2018[xxx]).

The Clyde Rebuilt project has been investigating adaptation finance as part of Deliverable 6 (Resource Mobilisation Plan). This plan looks at the available financing sources in Scotland and Glasgow that could be mobilised to fund the interventions identified in the Adaptation Strategy and the Blueprint Portfolio (CRC, 2020[xxxi]). A mapping of the sources of funds for GCR has been undertaken. This found that existing sources of adaptation finance for the region are mostly focused on the public sector, including from local authorities, other public bodies and agencies, as well as national government, UK government and/or the European Union (EU). These sources are presented in the Resource Mobilisation Plan. The plan also found that these sources of public finance are not sufficient to bridge the adaptation finance gap for the GCR.

Furthermore, over the course of the resource mobilisation work, the insufficient public funds and barriers to attracting private investments for adaptation suggested the need to explore **transformative finance** as a theme of itself in the Portfolio, in addition to underpinning a broader set of portfolio activities. Therefore, we have also applied the Deep Demonstration method to take forward climate adaptation financing.

Interviews with public and private financial stakeholders were held as part of the project (see Deliverable 6, Resource Mobilisation Plan). A review of the literature, and additional information from these stakeholder discussions identified a number of constituents and structural elements of this problem space, i.e. that explain the underinvestment in adaptation (CRC, 2020):

- **Many adaptation investments are public goods** (e.g. flood defence) or in non-market sectors (health, ecosystems) and do not generate income for investors (UNEP, 2018).
- **Many adaptation investments are a defensive expenditure**, i.e. they reduce the risks of future damages. However, such investments do not generate obvious benefits or a clear revenue stream, they merely reduce future impacts relative to the counterfactual.

- **There is often a mis-match between an adaptation investment in the short-term and the benefits it will deliver (from reduced climate impacts) which are in the medium or long-term**. This reduces the attractiveness of adaptation for the public sector, compared to other investment options that result in shorter term benefits. This means that the investment rate of return is too low for private investors (OECD, 2015[xxxii]).
- **Many of the benefits of adaptation projects are in the form of co-benefits.** These include non-market benefits (e.g. improved health, environment, well-being). These are relevant for a public sector project, which take into account the economic benefits, but they are often irrelevant for a private sector rate of return.
- **Climate impacts and adaptation assessment is challenging**: it requires considerable information and is often a highly technical analysis, around which there is high uncertainty (Warren et al., 2016[xxxiii]). This means information can be a constraint and it also increases project risk (over possible benefits and returns) for investors.
- **Mitigation and adaptation will rarely compete for available resources or finance with each other**, but there is more chance that adaptation will compete against other public policies (education, health), especially when considering mainstreaming (building climate resilience into existing policies and plans) (Watkiss et al, 2015[xxxiv]).

These challenges mean that even public sector financing of adaptation is difficult, especially for long-term transformational adaptation. Financing of adaptation from the private sector is even more challenging, because it is difficult to generate a revenue or income stream from adaptation projects (much more so than for mitigation projects). This has led to a focus on the 'bankability' of adaptation interventions, i.e. their suitability for financing, particularly those looking to involve the private sector.

What is clear is that public budgets are – on their own – insufficient to address the current adaptation gap for the region. Furthermore, the current approaches for private sector financing, as being advanced for mitigation, are not directly transferable to adaptation. This means that something different is needed, i.e. a more transformative approach is needed.

In summary:

- There is a large adaptation financing gap in GCR, arising from insufficient public funds as well underinvestment by the private sector. The analysis of current adaptation expenditures in the region (CRC, 2018) finds these are low relative to likely adaptation needs (CRC, 2019). An increase in the proportion of direct grants for adaptation is needed to address the market failures of some of the adaptation interventions and investments, and to fund those for which there is limited private sector interest. However, this is not sufficient on its own.
- Most current adaptation in the region is funded by public grants (CRC, 2020). There is a lack of innovation in the use of available public funds, and the potential to use available public funds to unlock/crowd-in private sector funding. This requires new financing models and bended finance solutions that encourage the private sector to invest.
- There is insufficient funding for innovation. Current adaptation in the region is primarily focused on incremental adaptation and focuses on existing areas such as flooding (Watkiss et al., 2019). Adaptation solutions are instrumental to building resilient, sustainable societies, yet adaptation innovators often struggle to find the necessary support to incubate and scale up such solutions. There is a need to build upon the existing research and development funding to administer new innovation grants programme tailored for transformative adaptation solutions.

- There is a need to get a better understanding of potential revenue streams associated with different opportunities, and to develop potential interventions that could provide revenue streams, or portfolios that include a mix of investment opportunities (a mix of public and private investments). Discussion with stakeholders identified some of these potential opportunities, citing examples from other regions.
- There is a need to consider policy incentives in influencing private sector action, e.g. in green infrastructure, buildings codes, or subsidies to ensure climate resilience. Further attention is also needed to better understand primary private investment risks and design de-risking solutions that best address these. The initial review of the financing landscape indicated that such tailored de-risking solutions are scarce.

Clyde Rebuilt has also developed systems thinking for the adaptation finance landscape (to mirror the approach used for heat, health and well-being), including social network analysis.

Strategic fit (Relevance) for EIT Climate-KIC

The area of transformative adaptation finance is a strategic fit for EIT Climate-KIC and is relevant to the EIT Climate-KIC Deep Demonstration on Healthy Clean Cities and action on Transformative Capital[xxxv] (Hofstetter, 2020[xxxvi]). It is clear that to deliver the scale of adaptation needed, more and different types of finance will be needed, and the availability of public finance will not be sufficient on its own. Given the synergies with the net zero transition, it will also relate to the entire cohort of regions and cities across the Deep Demonstration programmes.

Other funders and players:

There are some organisations in this space, but they are primarily focused on financing international (non-Annex 1) adaptation, e.g. the Global Commission on Adaptation and its action track on finance, as well as the World Bank (2020[xxxvii]). We consider there to be a need for a European innovator to support the development of this area.

There will be a need for partnerships, but these will form as the potential financing instruments and relevant actors emerge. They are likely to include public investment banks (e.g. European Investment Bank, Scottish Development Bank, Green Investment Bank), as well as impact investors. Local, regional, national and European perspectives are likely to be relevant, reflecting different potential sources of funding.

To explore this, the study has developed a social network map for adaptation finance to map the potential actors involved in the landscape. This is shown below. This draws out the potential interaction between public, private and third sector actors to finance adaptation. The closer the actor to the centre, the greater their role in adaptation finance and the greater likely ease of finance. This map is useful to understand which actors already play a strong role in financing adaptation, and which ones need to be provided with incentives and enabling environments to encourage their participation.
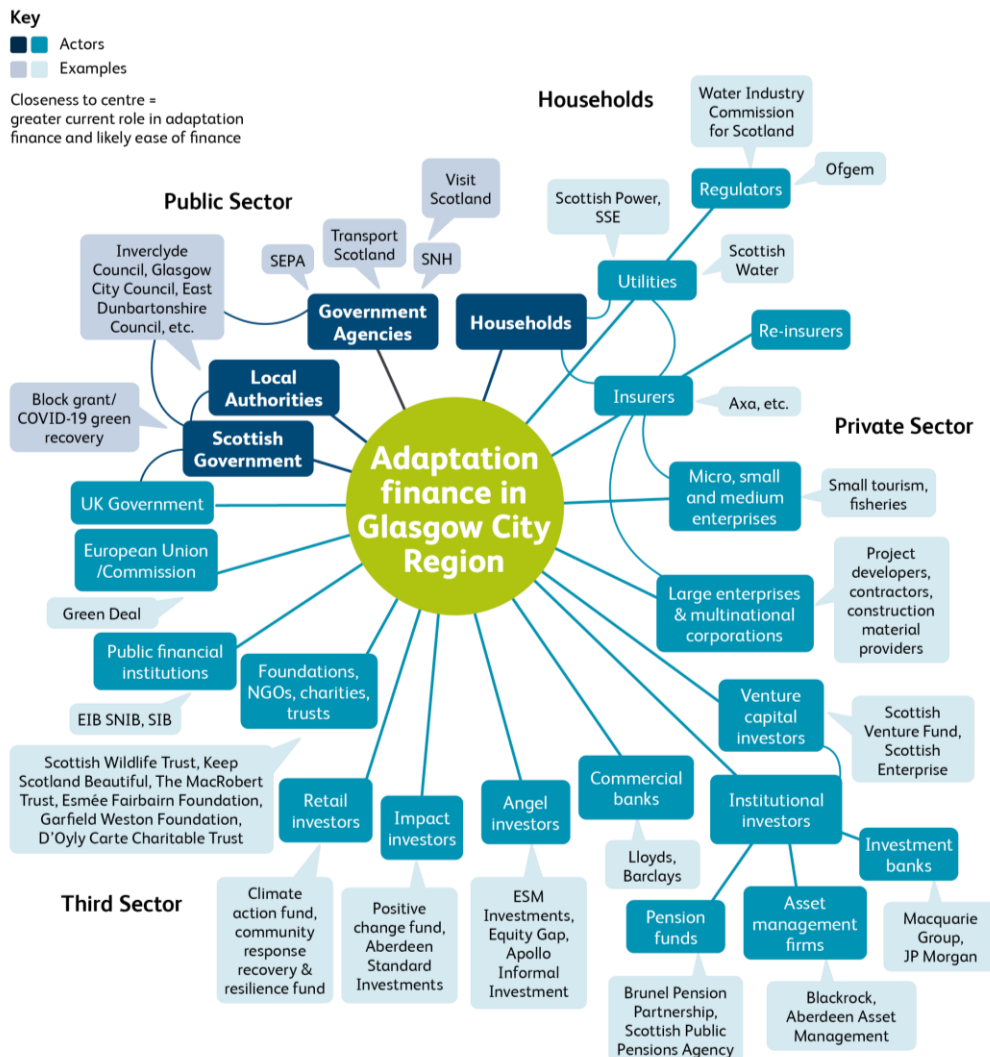
Adaptation Finance Social Network Map

Key

- ■ ■ Actors
- ■ ■ Examples

Closeness to centre = greater current role in adaptation finance and likely ease of finance

Households

Water Industry Commission for Scotland

Ofgem

Public Sector

Visit Scotland

Scottish Power, SSE

Regulators

Inverclyde Council, Glasgow City Council, East Dunbartonshire Council, etc.

SEPA

Transport Scotland

SNH

Scottish Water

Government Agencies

Households

Utilities

Re-insurers

Local Authorities

Insurers

Axa, etc.

Private Sector

Block grant/ COVID-19 green recovery

Scottish Government

Adaptation finance in Glasgow City Region

Micro, small and medium enterprises

Small tourism, fisheries

UK Government

European Union /Commission

Large enterprises & multinational corporations

Project developers, contractors, construction material providers

Green Deal

Public financial institutions

Foundations, NGOs, charities, trusts

Venture capital investors

Scottish Venture Fund, Scottish Enterprise

EIB SNIB, SIB

Scottish Wildlife Trust, Keep Scotland Beautiful, The MacRobert Trust, Esmée Fairbairn Foundation, Garfield Weston Foundation, D'Oyly Carte Charitable Trust

Retail investors

Impact investors

Angel investors

Commercial banks

Institutional investors

Investment banks

Third Sector

Climate action fund, community response recovery & resilience fund

Positive change fund, Aberdeen Standard Investments

ESM Investments, Equity Gap, Apollo Informal Investment

Lloyds, Barclays

Pension funds

Asset management firms

Macquarie Group, JP Morgan

Brunel Pension Partnership, Scottish Public Pensions Agency

Blackrock, Aberdeen Asset Management

Figure 5: Glasgow City Region Adaptation Finance Social Network Map. Source Clyde Rebuilt.

Emergence of Problem Space 3

It is important to reflect that as our work developed with stakeholders and as the Consortium further explored the Positions within the two defined Problem Spaces, a third Problem Space emerged in the later stages of the process:

Problem Space 3: The huge potential for genuine community empowerment across GCR, can only be achieved by harnessing and mobilising the knowledge, influence, energy and agency of people and organisations working in their communities who are so far unfamiliar with and disconnected from the current narrow framing and discourse around adaptation.

The consortium plans to explore this third Problem Space further, since it offers huge scope and potential for transformational adaptation. Plans for how this will be taken forward are set out in section 1.7.

1.3 Describe the Positions

For each of the two Problem spaces, we have identified a series of Positions which present the potential for a series of Innovative Actions, which could constitute a Portfolio. These are summarised below:

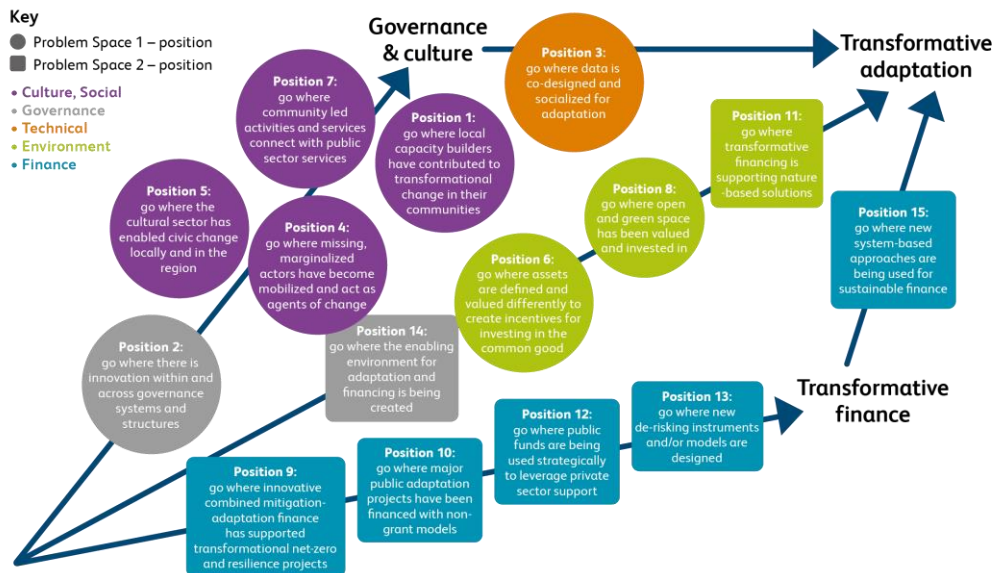| Problem Space	Positions – Go where/to…
1) Heat, Health and Well-being	1. Local capacity builders have contributed to transformational change in their communities
	2. Innovation within and across governance systems and structures
	3. Data is codesigned and socialised for adaptation
	4. Missing, marginalised actors have become mobilised and act as agents of change
	5. The cultural sector has enabled civic change locally and in the region
	6. Assets are defined and valued differently to create incentives for investing in the common good
	7. Where community led activities and services connect with public sector services
	8. Open and green space has been valued and invested in
2) Transformative Adaptation Financing	9. Innovative combined mitigation-adaptation finance has supported transformational net zero and resilience projects
	10. Major public adaptation projects have been financed with non-grant models
	11. Transformative financing is supporting nature based solutions
	12. Public funds are being used strategically to leverage private sector financing
	13. New de-risking instruments and/or models are being designed and implemented
	14. The enabling environment for adaptation financing is being created
	15. New system-based approaches are being used for sustainable finance

Portfolio Innovation Visualisation

Figure 6: Portfolio Innovation visualisation. Source: Clyde Rebuilt.

Positions for Problem space 1: Heat, Health and Well-being

Position 1: Go where local capacity builders have contributed to transformational change in their communities

Building and mobilising community capacity will more likely influence the local response to climate impacts and adaptation to climate change. Community-led activity across GCR is high. There are many voluntary, third sector initiatives which support and build community resilience and cohesion. They often operate in the absence of public sector support, not as a result. COVID-19 has shown this to be even more the case. The new Community Empowerment Act is not yet driving the change required: power still sits centrally within Local Authorities. Many examples of innovative community capacity- building are unexplored because they are not yet widely known, and rarely formally documented. Understanding the experience of people building the capacity of the community will help to identify how to connect with communities, how to better understand and meet local needs and how to build inclusive, empowered and locally led transformation.

Position 2: Go where there is innovation within and across governance systems and structures

Current governance models often cultivate and embed silo approaches. At present, cross sectoral collaboration in policy making, planning and delivery is limited, bringing a false sense of competing priorities and little pursuit of co-beneficial and long-term solutions. New types of governance are emerging which create the conditions and capacities for aligned, interconnected decision making, proving to bring innovation and creative ideas.

As an example, shifts in the governance of building regulations, codes and standards could support both net zero commitments and adaptation efforts, to ensure that the building stock is reducing emissions and addressing fuel poverty, while also climate ready. However, to do so would require

the contributions and actions of regulators, contractors, developers, architects, construction industry, housing associations etc. Intervening to create the conditions for a virtuous circle of governance and engagement across these actors, has the potential to promote and lead an overarching and integrated view to building standards.

Position 3: go where data is codesigned and socialised for adaptation

Data (e.g. for information on risks/hazards, such as future heat, early warning on extremes, etc) is widely applied and its value is well understood. However, data tools and the results are rarely shared, even within one organisation. The connections across different issues and trends are often missed (for example, open space locations matched to local health indicators) which means proposed solutions are often narrow in scope and incremental. Data tools are also often designed without the user's input and can miss or overlook useful trends and behaviours. Learning where data sets have been co-designed, co-produced, applied and shared to bring new insights, knowledge and analysis can help to inform and facilitate a system wide approach.

Position 4: go where missing, marginalised actors have become mobilised and act as agents of change

It is often the most marginalised, disempowered and vulnerable, living on the 'edge' of society, who's views are not included in the forming of policy and its implementation. This means their needs are not heard, and they hold no ownership over decisions made on their behalf and which will directly impact them. These are also the groups that are most likely to be disproportionately affected by climate change. Older and younger generations are often left out, as well as many ethnic minority, black, mixed race and Asian communities. Learning how these missing views are not only taken into account but are mobilised would be helpful. The Scottish Independence referendum in 2014, was a one-off in allowing 16 and 17-year-olds to vote. Of the record 3.6 million voters, more than 100,000 were aged 16 -17, calculated to be 75 percent of that age bracket[xxxviii]. These figures represent a considerable improvement on the percentage voting for the four UK general elections that have taken place since 2000 where the figure has not reached 70 per cent of the eligible electorate. The figures also dwarf those recorded for all the Scottish Parliament elections since 1999. The impact of youth-led groups and groups targeting support to older people (e.g. Glasgow's Golden Generation) where they have helped to mobilise action is also relevant.

Engaging different voices, empowering them to tell the story that is meaningful to them and their audience allows different types of conversations and greater understanding and awareness to what climate change means to people. Engaging with local cultural and creative arts groups, has shown how applying different communication tools and styles can help to reach new audiences, with exciting and inspiring responses and outcomes.

Position 5: go where the cultural sector has enabled civic change locally and in the region

There is a strong history in GCR and Scotland of culture bringing about civic change, with a growing awareness of its importance again following a dip after the 1980s.

Experience within the project so far demonstrates the need to change the language, that different voices are needed to bring different perspectives and that application of creative practices may provide different outcomes. GCR is the home to many famous festivals, theatres, orchestras, museums, music venues as well media headquarters including BBC Scotland and STV.

The Glasgow's Miles Better campaign launched in 1983 gave an impetus to a declining city[xxxix]. It featured the image of the children's book character Mr Happy taken from Robert Hargreaves's the Mr Men books. The slogan of the campaign was devised with the specific purpose of changing the city's reputation as a dark, dangerous and dismal conglomeration of slum housing and urban, economic decay. External perceptions of the city changed as a result, but more importantly the slogan gave Glaswegians the opportunity to articulate the pride they felt in their city. By adopting it wholeheartedly they not only helped the campaign succeed but created the positive attitude, pride, sense of connection and identity that were essential ingredients for the city's revival.

2020 marks the 30-year anniversary of Glasgow's celebrations as European Capital of Culture. Holding the title had a transformative effect on the city, helping to fuel regeneration and revive the sense of community among Glaswegians. Recognition of the huge value of the cultural sector and arts in the city rippled across the city region and brought a new sense of energy, identity and connection. After Glasgow's year as European City of Culture, the City Council commissioned a report to assess its position and inform decisions about its future. 'Monitoring Glasgow 1990'[xl], by John Myerscough, one of the creators of the field of cultural economics, was designed to provide:

- a statistical picture of attendance at arts events and attractions
- an analysis of the 1990 market for Glasgow's cultural programme
- an assessment of the economic and social impact of Glasgow 1990, including an account of the development in Glasgow's cultural sector
- an indication of any post-l990 opportunities arising from the lessons of Glasgow 1990

This assessment provided a benchmark against which future development could be measured.

Position 6: go where assets are defined and valued differently to create incentives for investing in the common good

Assets can be viewed not merely in terms of physical things. Health, physical and mental well-being are equally vital to a flourishing, sustainable society. The role of green infrastructure (see connection to Position 8 below) in supporting our mental well-being, as well as the cultural sector and creative arts as a means of communication and human connection can equally be viewed as assets. Understanding public value creates new incentives to invest in the 'common good'. Public value is not just about measuring how the public or society benefits from the value that is created; it is also about how it is created in the first place.

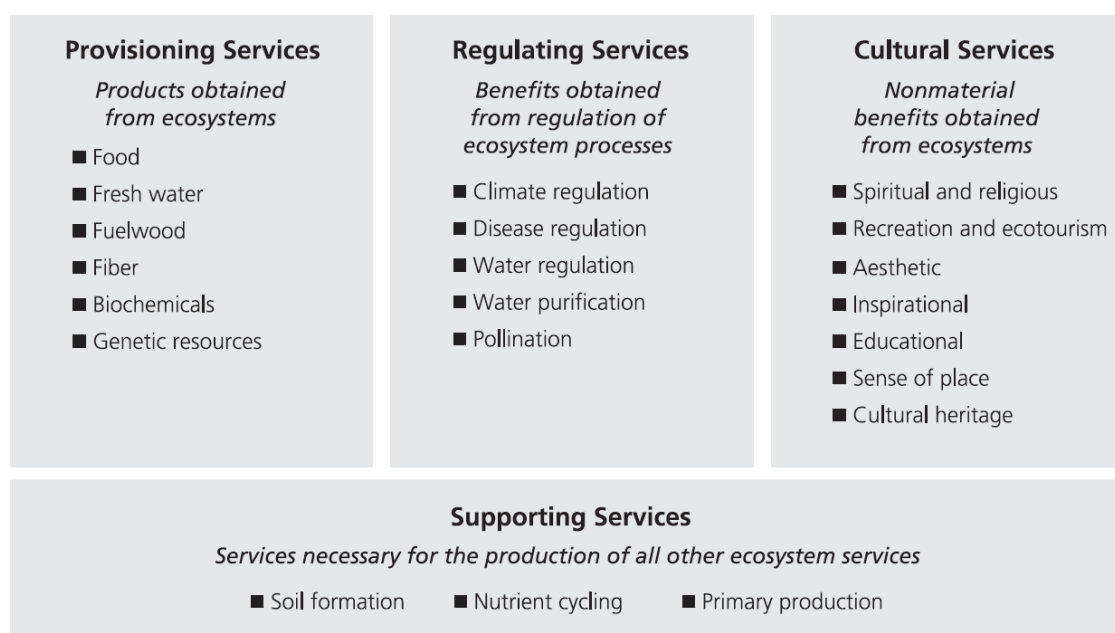**Position 7: go where community led activities and services connect with public sector services**

Community led projects and initiatives are often run by and rely on volunteers, leading to limited capacity, a lack of long-term planning and a fragile existence. Connecting community initiatives with public sector services can often help to ensure longevity, relevant resourcing and provides a two-way channel of information and knowledge. It often leads to better informed and targeted support on the ground to initiatives and networks that communities rely upon. Through these connections, community led activities can provide a central information channel to help build awareness, capacity, understanding as a conduit, that centralised public sector services often lack. How we define and understand what we mean by 'community' came up in our discussions with stakeholders. Broadening out the interpretation, to recognise all actors within a community, including businesses, private sector, public/local service providers, and not just local residents for example, can help to realise where innovation is possible.

Position 8: go where open and green space has been valued and invested in

The health benefits of access to open and green space are well recognised. Open spaces such as community gardens, green roofs, urban parks, woodlands etc also act as natural cooling, shading areas, supporting our ability to cope in a rapidly changing climate, bringing greater significance to how we invest in, protect and enhance them.

Valuing open and green spaces as 'assets', i.e. to monetise or quantify the benefits they bring in terms of health and well-being and to incorporate this evidence so that open space is protected and enhanced is linked to Position 6 above. Use of data so that open space is fully integrated into data analysis and 'open space strategies' is also linked to Position 3 above.

It can be captured in the concept of ecosystem services, and the role of nature-based solutions in Provisioning Services; Regulating services; Cultural Services and Supporting Services.

Provisioning Services

*Products obtained
from ecosystems*

- Food
- Fresh water
- Fuelwood
- Fiber
- Biochemicals
- Genetic resources

Regulating Services

*Benefits obtained
from regulation of
ecosystem processes*

- Climate regulation
- Disease regulation
- Water regulation
- Water purification
- Pollination

Cultural Services

*Nonmaterial
benefits obtained
from ecosystems*

- Spiritual and religious
- Recreation and ecotourism
- Aesthetic
- Inspirational
- Educational
- Sense of place
- Cultural heritage

Supporting Services

Services necessary for the production of all other ecosystem services

- Soil formation
- Nutrient cycling
- Primary production

Figure 7: Nature-based solutions as ecosystem services (Source Millennium Ecosystem Assessment)

By regarding these as services, the perception of future risks and opportunities, changes. 'Natural capital' is regarded as the elements of nature that directly or indirectly produce value to people, including ecosystems, species, freshwater, land, minerals, the air and oceans, as well as natural processes and functions. Natural capital is a broad term that includes many different components of the living and non-living natural environment, as well as the processes and functions that link these components and sustain life. Natural capital assets include all biotic and abiotic assets (e.g. species, ecological communities, soils, freshwaters, land, atmosphere, minerals, sub-soil assets and oceans) and include both designated and undesignated habitats and species. The magnitude of a risk on a natural capital asset can be measured using any of the quantitative or qualitative indicators, and not just those described using the term 'natural capital'.

The pandemic forced a re-evaluation of open spaces and a greater appreciation of outside space. New approaches on open space standards, design guidance, exemplars to promote 'outdoor living' would be helpful.

How to maximise and make better use of NHS owned open space around hospitals and medical centres, and also transport/utility corridors, (engaging with Network Rail, Transport Scotland, Scottish Water, Scottish Power Network, etc) have roles to play here.

There are often challenges associated with ongoing care and maintenance of these spaces. Building an emotional or personal connection to open and green spaces, as well as community led initiatives can help drive a sense of responsibility and ownership.

Derelict, vacant and degraded land (often in densely populated, urban areas) offers huge potential to be converted to green space, growing space, community run space, meeting areas for local residents etc. Complex issues are often associated with these regeneration programmes, including land ownership, transferring assets to local communities, soil restoration and investment.

Positions for Problem Space 2: Transformative adaptation finance

The Problem Space involves the consideration of two dimensions for adaptation finance. These are:

- The type of adaptation – incremental or transformational;
- The type of financing – conventional or transformative.

Together this forms a matrix, shown below. Clyde Rebuilt is looking in all the cells of this matrix, in order to look at funding the Adaptation Strategy and the Portfolio Blueprint.

However, **the focus for the Portfolio Blueprint, and the Positions, is to explore the right-hand column, i.e. on transformative finance**, to help finance incremental and transformational adaptation.

	Conventional finance	Transformative finance
Type of Finance		
Incremental adaptation	Public sector funds using grants, i.e. business as usual	New instruments or financing models to scale-up adaptation
Transformational adaptation	Public sector funds for new innovative adaptation, or delivering at scale	New instruments / financing models for innovative and systemic adaptation

Figure 8: Matrix and Examples of Type of Adaptation versus Type of Adaptation Finance. Source: Clyde Rebuilt

Position 9: go where innovative combined mitigation and/or adaptation finance has supported transformational net zero and resilience projects.

There has been a lack of finance specific to adaptation, but as highlighted above, there has been a strong uplift in mitigation financing. While mitigation is easier to monetize, there are some new financing models that are emerging, some for mitigation that can be transferred to adaptation, and some that involve a combination allowing cross subsidisation between mitigation-adaptation initiatives. These provide a set of positions to explore.

Position 10: go where major public adaptation projects have been financed with non-grant models.

It is possible to combine projects into a portfolio that includes components with different typologies and risk/return characteristics, such that the overall portfolio still provides a viable investment opportunity (Medda et al., 2013[xli]). In effect, the good financial returns of some projects can compensate (cross-subsidise) for the 'poor' financial returns of other project, e.g. for projects that do not generate revenues (e.g. public goods, non market investments).

Position 11: go where transformative financing is supporting nature based solutions

Nature based solutions (NBS) provide ecosystem-based alternatives to address societal issues, including climate challenges. NBS is an 'umbrella term' that include applications such as ecosystem-based adaptation (EbA) and Green Infrastructure (GI). In the context of adaptation, it centres on the use of ecosystem-based approaches to reduce climate risks, particularly as an alternative to grey

infrastructure or solutions. This can include flood management, or water management, but also heat reduction. NBS provide similar economic benefits (e.g. in reducing climate impacts) but also provide wider social and environmental benefits. There has been an increasing focus on finance specific to nature based solutions (across all areas, not just for climate adaptation) and there are a set of positions to explore.

A financing approach for green infrastructure could involve the identification of a value-added revenue stream, around which other non-revenue generating benefits can be realised. The value proposition embeds the costs and benefits of these nature-based solutions into the wider business case for 'sustainable urban living'. Grey infrastructure i.e. engineered infrastructure – can also be combined with nature-based solutions to create hybrid systems that improve resilience to climate impacts.

Position 12: go where public funds are being used strategically to leverage private sector financing

There are insufficient public funds to meet the adaptation finance requirements for GCR. To ensure that these funds are used most effectively, and to lever in additional private sector financing, innovative blended finance models are needed. Such blended finance models are already being successfully used to attract private sector finance, however further efforts are needed to scale and replicate such approaches.

Position 13: go where new de-risking instruments and/or models are being designed and implemented

De-risking of adaptation interventions is key to attracting private sector investments. There is a lack of such derisking solutions that address both technical and financial risk. In putting together such solutions, available public funds need to be used in a targeted way to address these risks. This can include looking at new insurance and guarantee instruments.

Position 14: go where the enabling environment for adaptation financing is being created

There are gaps in public funding to create the enabling environment for adaptation, i.e. that can help to crowd in other actors into adaptation, including the private sector. These include setting up of governance and leadership structures, promotion of collaboration between actors specific to adaptation, supporting policies and fiscal incentives, introducing standards, and sharing of lessons learnt through robust monitoring and reporting platforms for adaptation.

Position 15: go where new system-based approaches are being used for sustainable finance

The EIT Climate-KIC initiative (and white paper) on Transformation Capital is relevant to this final, and most ambitious position (Hofstetter, 2020[xlii]). This argues that the current financial system is flawed, in terms of its methods and allocation of capital, and will not be able to address the deep systemic change needed to address the climate challenge. This is because the current financial system has a narrow notion of value, constraining financial mathematics, and a low sense of responsibility over social outcomes. The paper also concludes that sustainable finance initiatives (SFIs), while positive, can only deliver incremental change, because they act to preserve the structural fabric of capital markets, and thus existing financial orthodoxy and current wealth preservation. It concludes a radically new approach is needed. This involves investing with the explicit aim of systems transformation, deploying capital from a different perspective. This will involve different methods, structures, capabilities, and decision-making frameworks.

1.4 Reconnaissance brief summary

The Deep Demonstration approach recommends focusing on a small number of major Problem Spaces. However, as found in the GCR Climate Risk and Opportunity Assessment[1] (GCR CROA) (CRC, 2018), a very large number of possible themes could be considered in the Deep Demonstration Pilot. For Clyde Rebuilt, two areas were selected.

A decision was made early in the process, based upon an initial workshop with the Challenge Owners and as a result of internal inquiry and questioning amongst the Consortium, to apply the Deep Demonstration method in a less-understood climate risk. Most of the historic focus on adaptation in GCR has been on flooding, a climate risk with a complex and crowded existing political and governance landscape. It was decided that a novel approach, applying systems thinking, might therefore work better and get more buy-in, in a new area. **The first Problem Space selected was therefore around heat, health and well-being**. This was chosen because this risk has not been considered in detail to date in GCR but will be important in the future. It also has an important linkage to the net zero transition, and requires system thinking because of the influence of the built and natural environment as well as the health and broader well-being domain. Subsequent workshops with stakeholders tested the theme, with positive feedback, resonating well with stakeholders, demonstrating good potential for new inquiry in order to explore a wide range of complex issues reflecting a systems based approach.

The second area chosen was a cross-cutting theme, to move away from a hazards-based approach. There are several potential themes that could have been considered, but early work on adaptation for CRC (Watkiss et al, 2019[1]) identified the importance of finance, both as a precursor for incremental adaptation, but also the need to develop new types of finance. Not unique to GCR, the theme is relevant more broadly, allowing good discovery of innovation elsewhere and a strong potential for replication in other regions. **The second Problem Space selected was around transformative adaptation financing**.

For the identified Problem Spaces and Positions, we have undertaken Reconnaissance to identify some of the research, projects and activities that have the biggest potential for innovation and transformative change. The Reconnaissance has also provided the opportunity to learn from experience elsewhere and to help advance and inform the Problem Spaces and Positions.

As well as ongoing exploration and inquiry with stakeholders as part of the Deep Demonstration methodology, we have pursued our own internal learning, using the specialist knowledge from Sniffer, PWA and Creative Carbon Scotland, as well as a review of existing projects from EIT Climate-KIC's Exaptive tool, and other resources. It has also drawn on background work on the review of the finance landscape in Scotland.

The full Reconnaissance Report is available in Annex B.

Heat, Health and Well-Being: Summary of the Reconnaissance

Reconnaissance Position 1: go where local capacity builders have contributed to transformational change in their communities

The city of Medellin, in Colombia, the second largest in the country, with a population of 2.3 million, is predicted to have 150 days a year above 29 degrees by 2040-50. The C40 and Ramboll have developed a tool to assess the potential of adaptation actions on urban temperature reduction to improve health of cities. This project aimed to use green infrastructure to reduce the urban heat island effect in Medellin. The project has trained 75 locals from disadvantaged backgrounds to be city gardeners and planting technicians for planting green corridors. Not only empowering and building capacity of people at the heart of their community, this has also helped to ensure ongoing

maintenance, care and most importantly a sense of ownership of the green corridors. Furthermore, the green corridors are increasing value through positively impacting on citizens' lives. Interconnectedness and mobility have increased biodiversity. It has increased the aesthetics of the area as well as having health benefits.

Reconnaissance Position 2: go where there is innovation within and across governance systems and structures

Madrid is a 'city turning eco-fictions into eco-futures through systems innovation'. This project involved a cross-sectoral alliance using creative arts in a city-wide decarbonisation and resilience project. Current climate threats to the city include hotter summers, increased freak weather events and increasingly congested traffic. Madrid has developed a 360 Environmental Sustainability Strategy. The project has been using creative arts to work towards decarbonising the city. One example of this is helping residents to imagine what a low carbon city would look like (eco-fictions). The aim is to develop solutions to bring the eco-fictions to life and to help everyone to better visualise a low carbon future.

Partners included city governments working with designers. The partnership had no hierarchy; all partners were equal rather than a top-down approach being applied. Governance approaches were changed to be more horizontal to move past 'business-as-usual'. The change to horizontal governance implies a different mode of working together and learning together. Everyone worked towards a shared vision. The partners of the project learned flexibility and responsiveness are hugely important. EIT Climate-KIC's partners shared the following learning: "Just because everyone starts on the same page, doesn't mean that circumstances don't change. Also, learning happens as the project evolves, and this should lead to tweaks and changes."

Reconnaissance Position 3: go where data is codesigned and socialised for adaptation

The municipality of Karlstad in Sweden has developed a climate service to support adaptation to multiple water hazards. The area of the project is a dense, attractive residential area that is at risk of flooding. There was a need to work out how to adequately provide flood protection and what to prioritise. The team specifically looked at how co-designed climate services can support adaptation processes better by focusing on the needs of users. Co-design of data focused on assessing how to provide flood protection, whether it would be an effective adaptation measure and where it would be best placed. The final climate model developed has helped the municipality in its appraisal process in advance of budget and implementation decisions. It was hoped that co-design approaches would better help decision-makers to address climate and non-climate related concerns and priorities.

Reconnaissance Position 4: go where missing, marginalised actors have become mobilised and act as agents of change

Leuven 2030 is an NGO founded by 60 members including local government representatives. Inhabitants, companies, civil society organisations, knowledge institutions and public authorities are represented. It works to reduce carbon emissions using science, social power and storytelling.

Leuven 2030 is a governance model that devolves responsibility away from the municipal authority for achieving carbon neutrality. The model for Leuven 2030 resulted from 18 months of discussion between five stakeholder groups: city government, citizen groups, knowledge institutions, companies and investors. It now claims to be the world's biggest organisation with over 600 members. The governance model used is open and transparent. The model is described as horizontal because everyone is included. A range of actors feel ownership of the roadmap because

of this horizontal approach. Leuven 2030 aims to include all actors in the system, not just the usual suspects. Everyone within Leuven 2030 is considered equals as partners. Everyone has a specific role and is valued for their unique contribution. An advantage of involving such as range of people is that the interventions in the roadmap cover the full spectrum of the city.

Reconnaissance Position 5: go where the cultural sector has enabled civic change locally and in the region

The SLOW clean up civic experiments, based in Chicago, aims to run experiments that are designed to restore derelict land sites that were previously occupied by petrol stations. The project uses phyto-remediation to enhance soil cleaning and aims to create environmental, economic, social and cultural benefits. A range of partners work on the project including local artist Frances Whitehead who developed the method for this project, using creative, in-process problem solving to assess alternative options for land remediation that had not been considered previously. Frances worked with communities and scientists. Embedding the artist into city government on this project helped to bring new perspectives and mindsets to the project.

The Scottish based Stove Network, in partnership with artists, Community Land Scotland and six Community Trusts, is leading a project taking a collaborative approach to dig into the stories of community land ownership across Scotland and the impact it has had for communities. Stories of ownership are explored, including the effect for local people, their identity, decision-making and the economic and social benefits for their community. The project is working with artists who are using visual storytelling and collaborating with communities and individuals to capture stories of land ownership. The artists feel communities should have rights to their land but also ownership of their narrative. The aim is to create stories and work that speaks to a wide range of audiences to help develop projects that lead to real change.

Cuningar Loop is a Forestry and Land Scotland project to redevelop a derelict site, previously used for landfill and mining into an urban forest park with benefits for biodiversity, urban green corridors, and the well-being of residents. The project included two artists-in-residence who worked closely with the local community, running activities and producing work that responded to the history of the site. Rob Mulholland produced a large sculpture at the park entrance which was developed through community conversations. Community workshops around sculpture-making also occurred and the community sculptures were placed in the park. James Winnett helped to raise awareness of the woodland park and the benefits it would bring. One of the lessons learned was: "the involvement of the artists was important in connecting the logistical work of creating the park with a more personal level, providing a pathway for community involvement in the project".

Reconnaissance Position 6: go where assets are defined and valued differently to create incentives for investing in the common good

Reclaiming and greening derelict coal sites in Mainshill and Blairhouse Scotland, involves two land reclamation projects on former coalfield sites. The aim is to create woodlands using confiners and a mix of broadleaf native tree species to increase carbon storage. Partners include: Scottish Mines Restoration Trust, Forestry and Land Scotland, and communities. The project will increase the value of the sites to communities, through increasing wildlife and by putting in footpaths and bridleways. The value for recreation is increased. The trees planted at Blairhouse will be registered with the Woodland Carbon Code to verify the amount of carbon stored.

Reconnaissance Position 7: go where community led activities and services connect with public sector services

New York city has two community adaptation projects that aim to prevent extreme heat events, extreme precipitation and coastal flooding from damaging housing. Community participation has been important in designing the adaptation solutions. Both projects rely on community boards, civic groups, tenant associations and business owners in designing the adaptation strategies and planning for these neighbourhoods. They are also using a range of participatory planning, such as stakeholder working groups, public workshops, public meetings and community task forces. Wider community engagement ensures the outcomes reflect the desires of the communities most affected by climate change.

Reconnaissance Position 8: go where open and green space has been valued and invested in

As part of 100 Resilient Cities, Paris plans to transform 800 school yards into green spaces by 2040. It is hoped that concrete school yards will have increased vegetation and shade coverage, alongside drainable concrete surfaces to absorb rainwater. The goal is to use these green areas to provide respite in periods of extreme heat. The green spaces will be opened up to vulnerable people to use outside of school hours. It is hoped this will also improve social inclusion within the city alongside the respite from the extreme heat.

Transformative Adaptation Finance: Summary of the Reconnaissance

Reconnaissance Position 9: go where innovative combined mitigation-adaptation finance has supported transformational net zero and resilience projects

UK's first Community Municipal Investment Bond for West Berkshire Council was launched in June 2020, providing an excellent model against which to design a similar financial offering for local authorities in GCR, with an IRR of 1.2% over 5 years. The bond is issued directly to the public in partnership with the online crowdfunding platform Abundance Investment. Individuals can invest from as little as £5 to support projects that align with the Council's plan to build a greener future for the district. Crowdfunding can be both debt or equity based, depending on the underlying adaptation interventions, the risk profile of the return and available financing. The crowdfunding model allows organisations that provide small, low-risk loans to connect with individuals or groups that do not have easy access to finance. Crowdfunding platform 'Kiva' demonstrates how crowdfunding can rapidly scale-up finance. The platform has a global community of 1.7 million lenders that has helped fund more than $1.2 billion in microloans to three million borrowers in more than eighty countries. Impact investments make a financial return while delivering measurable social and environmental improvements.

Another option is to combine mitigation-based revenue streams with longer-term adaptation outcomes. For example, the first wind turbines to be built on dykes are being erected near Eemshaven in the Netherlands. The dykes are the primary flood defences for the area. Wind power operators pay usage fees for their plants, contributing financially to the maintenance of the dykes.

Reconnaissance Position 10: go where major public adaptation projects have been financed with non-grant models.
One recent example of a city administration financing adaptation with a non-grant model is in Copenhagen where Household water charges have been used to co-fund adaptation interventions for Copenhagen city. The funds are managed through the Copenhagen Cloudburst Scheme.[xliii] The scheme is a public-private finance model that was developed by the City of Copenhagen and Greater Copenhagen Utilities (HOFOR) to mitigate the city's high risk of flooding from cloud bursts.

xliv The Cloudburst Scheme aims to fund 300 adaptation actions over 20 years. The main stormwater runoff infrastructure (underground storage, drainage system) is financed through the collected water charges by publicly owned water utility companies. The fees are controlled and regulated by the local government. The greening component linked to improvement of public space is paid for by the local government (primarily through collected taxes). The remaining challenge is the finance of adaptation measures in privately owned buildings, for which a solution is pending. While this demonstrates it is possible to use such measures to fund adaptation, it is important to recognise that this involves a transfer, i.e. it is primarily households who pay for the adaptation through water charges.

Reconnaissance Position 11: go where transformative financing is supporting nature based solutions

There are a growing number of green infrastructure funding models. The Water Resilient Cities (WRC) initiative, a public, private and third sector partnership, is one that looks at a financing approach to fund a programme of SuDS based on future savings from reduced water charging bands. The model has been elaborated for the Greater Manchester Natural Capital Investment Plan. It is based around three main phases of SuDS project delivery development, construction and operation which require different forms of capital based on the level of risk. The model proposes to set-up a single Special Purpose Vehicle (SPV) to raise and deploy the appropriate form of capital for each phase over the project lifetime. The key requirement is that financing delivered is aligned to project lifetime cashflows, enabling overall financing to be leveraged as efficiently as possible. The model was developed based on an assessment of potential SuDS pipelines associated with Manchester City Council, including an analysis of those that are investible.

Reconnaissance Position 12: go where public funds are being used strategically to leverage private sector financing

The following examples are based on cases where public funds are being strategically used to attract private sector investment through a bond structure. The Forest Resilience Bond - one first of such bonds - supports the funding of a $4.6 million restoration project to mitigate wildfire risk in Tahoe National Forest, California. It was developed in 2018 by Blue Forest Conservation (BFC) in partnership with World Resources Institute (WRI).[xlv]

Social Impact Bonds (SIBs) are investments that address social issues and fund preventive interventions. Typically, social impact bonds draw in impact investors that provide flexible funding and expect lower returns. Financial payments are linked to performance-based results specific to the social outcomes set during the design.[xlvi] Under the 2010-15 Conservative and Liberal Democrat coalition government, the UK government created the Centre for Social Impact Bonds, with guidelines on developing SIBs in the UK.[xlvii] Since then, several SIBs have been issued in the UK, with Scotland's first for the Perth and District YMCA's 'Living balance project'.[xlviii] The Royal Bank of Scotland Group PLC issued its first SIB in 2019 which has raised € 750 million. The bond lends to small and medium sized enterprises that function in areas of the UK with highest unemployment and lowest job creation.[xlix] For adaptation interventions, SIBs can be used to capture the monetary value of longer-term social outcomes. The ongoing issue of measuring social outcomes of adaptation interventions will need to be resolved before the successful application of a SIB.

Reconnaissance Position 13: go where new de-risking instruments and/or models are being designed and implemented

An example is the coral reef parametric insurance policy (2017) for Quintana Roo, Mexico that provides immediate funding for post storm restoration of the protective functions of coral reefs.

The coral reef in the area protects both the people in the area and infrastructure that supports the area's tourism industry from potential storms.[i] A coalition including the Governor of the state of Quintana Roo, the Cancun Hotel Owners Association, Swiss Re and the Nature Conservancy have come together to design the coral reef insurance policy. Premiums for the insurance will be paid by local organisations and government, and the insurance industry will pay out if the reef is damaged by storms. Local organisations dependent on tourism will pay into a collective pot likely to amount to between $1 million and $7.5 million for the insurance premiums on the policy, the insurer will pay out sums likely to be $25 million to $70 million in any given year if there is storm damage to the insured reef system.

Reconnaissance Position 14: go where the enabling environment for adaptation financing is being created

The DERRIS project (2015-2018) is an example that aimed to increase the resilience of local economic communities by providing SMEs with the tools required to reduce disaster risks and manage emergencies. SMEs do not always have a sufficient understanding of climate risks, impacts to their businesses and measures to adapt. Even if they do, resources (including finance) are not readily available. The project designed an innovative partnership on climate change adaptation and resilience involving SMEs, public administrators and the insurance industry. The objective was to transfer climate and disaster risk management knowledge and experience from the insurance industry to SMEs and municipalities in order to create more resilient companies, strengthen local economies, and bring together effective local adaptation plans. To do this, a climate risk management tool was created for SMEs to improve risk awareness, assessment, prevention and reduction, both at the company and district levels. Support was then provided to help SMEs draw up a Company Adaptation Action Plan (CAAP).

Reconnaissance Position 15: go where new system-based approaches are being used for sustainable finance

The EIT Climate-KIC Transformation Capital initiative provides a series of prototypes: Circular Economy Transition in Slovenia; Developing Clean and Healthy Cities: The European Union's Innovation Missions; and A Just Transformation of Industry in the Basque Country. These provide useful examples of new system-thinking for finance. As yet the initiative has not developed a Trans Cap Prototype for Adaptation and Resilience – and this provides a possible opportunity for GCR to take on this role.

There is also a proposal to set up a regional Environment Fund for Greater Manchester (GMEF), made by a partnership between Greater Manchester Combined Authority and Lancashire Wildlife Trust. A detailed assessment went into recommendations for setting up the Fund, which is ready for launch along with a developed pipeline of near- and medium-term investment opportunities. GCR and Greater Manchester share similar risks and impacts of climate change, and also challenges to attract finance.

1.5 Design Principles

The Design Principles for the Portfolio Blueprint are brought together from the parallel workstreams of Clyde Rebuilt, including the draft Adaptation Strategy (Deliverable 2), Literature Review (Deliverable 10), Theory of Change (Deliverable 1), Resource Mobilisation (Deliverable 6), identification of Problem Spaces, and from the underpinning basis for the proposition.

The Principles underpinning transformational adaptation are:

- **Multiple, plural definitions of transformational adaptation exist -** we do not believe it is possible to produce a single overarching definition of transformational adaptation. However, our Literature Review suggested that the use of systems thinking, the level of change and the sustainability of the intervention, as well as having positive spill-over benefits are all hallmarks of transformational adaptation (Clyde Rebuilt, 2020)
- **Synergies with Net Zero** – an Innovation Portfolio should consider the net zero transition due to the policy landscape and potential synergies and trade-offs between the two. This is particularly important given the Scottish Government[li] has committed to a target of net zero emissions by 2045 and will adopt an ambitious new target to reduce emissions by 75% by 2030. Glasgow City Council[lii] has announced a goal to be the UK's first carbon neutral city by 2030. It is essential that the net zero transition is made climate resilient.
- **Changing governance and thinking -** to deliver more transformational change, there may need to be changes in governance or current thinking within the area of consideration, and potentially beyond.
- **A 'messy process '** - transformational adaptation is likely to be messy. It will involve a range of actions, which spans incremental to transitional change, as well as from the risk/sector level up to an overall system. This means actions are unlikely to be binary, i.e. incremental or transformational, but rather part of a spectrum. In this regard, transformational adaptation is likely to involve a combination of initiatives, some of which may be transformational on their own, and some which are incremental but combine to enable transformational change as part of a portfolio of activities.
- **Explicit recognition of language and the framing** – the language and framing describing transformational adaptation can strongly influence the perception of action. For example, much of the literature defines transformational adaptation through the lens of social learning or governance. We accept that these should be activities to explore, as they could promote conditions for change, but we do not believe that all transformational adaptation has to have these attributes, i.e. we will avoid being too prescriptive.
- **Need for scale -** a transformational change should have scale. A set of transformational adaptation criteria will be used to assess regional adaptation options, but also as design and appraisal criteria for an Innovation Portfolio. The Literature Review identified a set of criteria, building on the transformational adaptation literature (Mustelin and Handmer 2013: David-Tàbara et al., 2018: Fazey et al., 2018: Fedele et al., 2019: Pal et al., 2019: Zografos et al., 2020[liii]).
- **A structured, systematic process** - it is possible to develop a systematic process for transformational adaptation, centred around the EIT Climate-KIC Deep Demonstration method, which includes varying tools and techniques. For GCR this includes a transformative vision, developed through the Theory of Change to guide action, the use of systems approaches and criteria-based approaches which emphasise transformation, as well as the use of cultural practices.

Principles supporting the Theory of Change:
- **Intrinsic value of nature:** Nature/biodiversity has intrinsic value and efforts to build climate resilience should do so in ecological, as well as human, communities
- **Climate & social justice:** People's lives can be made healthier and happier – and inequality/ vulnerability lessened – by efforts to build climate resilience
- **Revolution in understanding:** There needs to be a 'revolution in understanding' the potential impacts of climate change, and the adaptation options available

- **More of the same won't do**: An effective response to climate change will require a revolutionary approach
- **Revolution in planning:** There needs to be a 'revolution in planning'. We must rethink how we use land and space, and where and what we build, with planners empowered to prioritise climate resilience
- **Revolution in finance:** There needs to be a 'revolution in finance' to ensure that the funds and resources necessary to build climate resilience are made available
- **Recognising uncertainty:** Our future is uncertain; we need to reduce global heating and plan for worst-case scenarios, recognising that climate change is not a linear process

DESIGN PRINCIPLES – Heat, Health and Well-Being
- Accelerate a region-wide, just and equitable transition to being climate ready, in line with GCR's Adaptation Strategy.
- Empower and mobilise citizens, communities and business on adaptation efforts.
- Build deeper, more widespread resilience by scaling up actionable solutions to trigger transformation.
- Bring culture and the cultural sector to the fore of imagining a new future for the GCR.
- Reflect social justice principles:
  - Procedural justice (early, effective and meaningful involvement in the decision making process)
  - Intergenerational justice (impacts on older and younger people)
  - Distributive justice (impacts on those who are already more adversely affected by climate change)

DESIGN PRINCIPLES – Transformative Finance

- Increase the proportion of direct grants used to create the conditions for adaptation.
- Design innovative financial structures to help fund incremental and transformational adaptation.
- Create the policy frameworks and government to enable financing.
- Encourage public organisations operating in the GCR to move to a more commercial mindset, to help unlock investment from the private sector for adaptation.
- Develop innovation for adaptation financing, with a cycle of piloting and learning.
- Create a governance architecture for adaptation finance.

1.6 Innovation Actions examples

Problem Space 1: How GCR responds to future high temperature and heatwaves will depend upon the systems that support health and well-being of people and communities.

Position 1: go where local capacity builders have contributed to transformational change in their communities

Innovation Actions examples:
A new programme to equip social workers with the capacity and the knowledge to incorporate climate resilience into their community outreach. By encouraging new conversations, use of accessible language and communication, it can help to understand local needs, raise awareness of the issues, and ensure services and support are tailored to broader climate resilience issues. Social workers are mostly working with some of the most marginalised communities, who are often the

most vulnerable to climate impacts due to where they live, lack of financial means and awareness of how to respond to any climatic event, and dependence upon limited public services.

Position 2: go where there is innovation within and across governance systems and structures

Innovation Actions examples:

a) Seeking out innovation in governance and policy making is not especially straightforward or obvious, given the entrenched nature of how governance systems have traditionally operated. A potential programme of work with States of Change[liv], an organisation which has already explored the parallels of the pandemic response and experimentation in new policy and guidance could open up new ways of how policy is designed and implemented. Clyde Rebuilt has identified and established good relations with a wide set of stakeholders, including leading policy makers and implementers, for whom this programme, supported by States of Change could explore where innovation is possible.

b) Understanding where shifts in building regulations/standards may be possible offers opportunities in innovation, in terms of both net zero retrofit schemes and climate proofing. This area represents a crowded mix and influence of regulator, contractors, developers, architects, construction industry, housing associations, landlords etc. How to encourage a virtuous circle across these actors, may bring about innovation. Introducing a series of retrofit programmes, at a locality wide or neighbourhood wide level, bringing together these actors, and establishing a cohort of leading actors, to develop and raise the bar on building standards (from voluntary to mandatory) could open a platform of innovation that improves building resilience to warmer temperatures and other climate impacts, as well as reduced emissions. A number of design standards, including Leadership in Energy and Environmental Design (LEED), UK Green Business Council and Passivhaus could prove helpful, while recognising their limitations. The Supply Chain Sustainability School[lv] could be a helpful example of how to foster a virtuous circle across the construction sector.

Position 3: go where data is codesigned and socialised for adaptation

Innovation Actions examples:
An option would be to build upon the existing work of a number of Local Authorities, using data tools to map heat scenarios with existing local open and green space. Opening out the knowledge gained from established data tools, and expanding its application, to draw in local knowledge and experience can help to build more effective, accurate and usable data.

Position 4: go where missing, marginalised actors have become mobilised and act as agents of change

Innovation Actions examples:
Co-design and development of a Neo4j[lvi] style social networking tool that can be applied with key actors, to explore and understand dynamic systems, positions and gaps within them, and to identify levers of change and areas of intervention. Experimentation during workshops with stakeholders to apply a social networking tool can help to open up discussions, accelerate shared learning and identify with greater clarity the power dynamics of a system, the location of actors and the areas of intervention and possible innovation in a system. This type of tool can also support application of further systems thinking and approaches.

Position 5: go where the cultural sector has enabled civic change locally and in the region

Innovation Actions examples:
a) Develop and implement a dedicated programme of outreach with a selection of local cultural and arts organisations across GCR on exploring and communicating climate resilience. Through

a carefully managed process of co-design, working with and supporting local organisations to curate a series of workshops, events and activities that explore climate resilience based on their existing work, their own profile, approach and audience. The rich learning from Creative Carbon Scotland's work with RIG Arts and Glasgow Women's Library as part of Clyde Rebuilt would be relevant here (see Learning Exchange Report, Deliverable 8).

b) Continuation and further extension of Clyde Rebuilt's work with RIG Arts and Glasgow Women's Library, led by Creative Carbon Scotland (see Learning Exchange Report, Deliverable 8).

Position 6: go where assets are defined and valued differently to create incentives for investing in the common good

Innovation Actions examples:
Clyde Climate Forest (linked with and relevant to Position 11). This is an existing concept that has three interlinked components:

- **Canopy -** to increase urban canopy cover across the Glasgow conurbation and through new tree planting, particularly in areas of deprivation and at risk from the heat and flood-related impacts of climate change.
- **Connectivity** To plant new woodland, making connections in existing habitat networks to provide a potential migration route for woodland species from the headwaters of the River Clyde through to the Loch Lomond and Trossachs National Park.
- **Carbon:** to deliver carbon sequestration opportunities, notably on land owned by public bodies which could be the focus of carbon off-setting tree planting to help deliver net zero targets (but might also have a role in regional watersheds).

The financing option is to develop a fund for this. Establishing a community forestry investment fund could help to capture the ecosystem service benefits of forestry and act as a funding mechanism to crowd in private investments. A similar approach is being explored in England for the Community Forest Fund.

Position 7: go where community led activities and services connect with public sector services

Innovation Actions examples:
a) Replication of the Stove Network in other localities. The Stove Network is an 'arts and community' organisation located on Dumfries High Street in Dumfries & Galloway, Scotland. At the heart of everything they do is a love for their town and wider region. They see the arts not as something solely for an 'arts audience' but rather as a vital contribution to society on all fronts. As the only arts-led development trust in Scotland, they work alongside the local authority, community organisations, local businesses and charities to create a vision for the future of Dumfries High Street. They are aiming to create a place where culture, community and enterprise work hand-in-hand to support a new vision of the High Street.

b) A further innovation action can be drawn from Thriving Places, a ten-year commitment with Glasgow Community Planning Partnership to address inequalities and achieve better outcomes for residents in nine neighbourhoods experiencing high levels of deprivation. A genuine co-designed, and co-produced collaborative programme of regeneration and climate resilience with a small number of diverse, marginalised communities across the GCR, and Local Authorities would further enhance existing community based commitments. A meaningful collaboration, over a period of years, would equip communities and help connect them to direct support from local public services.

Position 8: go where open and green space has been valued and invested in

Innovation Actions examples:

The existing Vacant and Derelict Land Taskforce is working to bring vacant and derelict land back into public use. GCR has 50% of the 3,510 sites on Scotland's Vacant and Derelict Land Register. Working with the Taskforce, to engage with a wide cohort of stakeholders, and connecting the work of the Taskforce to local communities across GCR could offer a series of pioneering restoration pilot projects that showcase the potential in this initiative, with vast potential for scaling across Scotland. Restoration of some of these sites will provide communities experiencing levels of social, economic and environmental disadvantage with access to green space. The restoration of degraded sites would also help to transform them to profitable business opportunities that deliver biodiversity benefits.

Problem Space 2: Transformative Adaptation Finance

Position 9: go where innovative combined mitigation-adaptation finance has supported transformational net zero and resilience projects

Innovation Actions examples:
As highlighted above, the crowdfunding concept is based around the creation of a platform on which the capital investment required for a portfolio of projects can be aggregated from individual investors, to allow these projects to be financed and to provide a return for the investors who support projects. The concept is closely connected to impact investing, which are investments made with the intention to generate measurable social and environmental impact alongside financial return. As the underlying portfolio of projects can be put together by the local authorities, a combination of innovative adaptation interventions alongside more conventional renewable energy projects could be bundled together to generate net positive aggregate revenue streams from which to pay back investors.

In the GCR context, there is a particular potential to use this crowdfunding approach and combine with the focus on placemaking. Placemaking aims to transform urban spaces into people places, providing high incentives for the public to invest in such a crowdfunded bond. The crowdfunding approach could create an efficient, scalable and cost-effective alternative to the more conventional public funding sources such as the Public Works Loan Board (PWLB). In addition, it offers a powerful and innovative way for Local Authorities in the region to engage with citizens as investors. Crowdfunded bonds use a Community Municipal Bond (CMB) structure, to be issued by a Local Authority direct to the public via a crowdfunding platform

Position 10: go where major public adaptation projects have been financed with non-grant models.

Innovation Actions examples:
Household water charges could be used to co-fund adaptation interventions in cities, as an alternative or in combination with public funds, as in the Copenhagen example set out in the Reconnaissance section. The most obvious application for GCR would be a similar set of flood and water management related applications, including the use of nature based solutions, funded through the existing water charging regime.

Position 11: go where transformative financing is supporting nature based solutions

Innovation Actions examples:
The study has identified a strong value proposition for the integration of nature-based solutions into urban real estate development for GCR, potentially using the revenue streams generated from leasing of the real estate to finance other green infrastructure. The approach would require the identification of the urban (residential and/or retail) real estate areas, and also possibly be suitable

for Vacant and Derelict Land. The value this proposition delivers is through attracting real estate developers and/or financiers that develop the land on behalf of the Local Authorities. Dedicated grant funding could be considered as part of the model to incentivise the use of integrated, nature-based solutions approach in these 'green zones'. The value of the proposition is captured through the increase in urban real estate value it can result in.

Position 12: go where public funds are being used strategically to leverage private sector financing

Innovation Actions examples:
One option is to develop a dedicated Green Infrastructure Blended Finance Facility in GCR, which could be capitalised with funds from Scottish Government and local authorities, private foundations and look to also bring in private investors. A combination of concessional loans and grant funding could be provided. Commercial finance could be provided from a partner bank for the grey components. Loans would be paid back from the proceeds from sale of units and/or rent payments. There could be potential to consider funds such as from Clyde Mission as part of the grant finance component.

A further approach would be to develop the Clyde Climate Forest concept which is already live in the region, but bring out the adaptation elements of this more strongly, especially around one of the three main components which is focused on increased Urban Canopy Cover. This is looking to assess canopy cover across the Glasgow conurbation and identify opportunities to increase cover through new tree planting, particularly in areas of deprivation and at risk from the impacts of climate change. This could be financed using community forestry investment fund could help to capture the ecosystem service benefits of forestry and act as a funding mechanism to crowd in private investments. This could generate a predictable, secure and long-term funding stream to support the core forest-based activities for local authorities in GCR. Activities would include tree planting, bringing woodland into management, opening up woods for visitors, building and maintaining visitor facilities (e.g. footpaths, cycleways) and educational and community initiatives. Revenue streams could be generated primarily from forest products / charges for use of community forest areas by the local populations and tourists providing recreation, health and well-being benefits.

Position 13: go where new de-risking instruments and/or models are being designed and implemented

Innovation Actions examples:

This position has proved more challenging, and no suitable transfer opportunities for parametric insurance have been found. However, there is a large insurance industry based in Glasgow city, and there is an existing insurance market where there should be some potential to look at innovative insurance offering.

Position 14: go where the enabling environment for adaptation financing is being created

Innovation Actions examples:
GCR has a large base of SMEs, which could benefit from a partnership approach to collectively assess vulnerability to climate risks and to implement adaptation measures. Aside from lowering potential costs of climate impacts through targeted adaptation measures, such a financing approach could also prepare SMEs to address UK Government regulation that will require mandatory risk disclosures by businesses from 2025 onwards.

There is also likely to be major economic benefits from changing climate in GCR, notably from the reduced winter temperatures and reduced heating costs, which could potentially be monetised to create funds to help invest in creating the enabling environment for adaptation, and might also possibly generate revenue streams for adaptation interventions. The aim would be to use the opportunity created by climate change and use the reduced stress on the public finances towards other public spending for resilience.

Position 15: go where new system-based approaches are being used for sustainable finance

Innovation Actions examples:
There could be an opportunity for GCR to develop a dedicated investment vehicle for the region, that would work across climate action areas for adaptation. The vehicle would coordinate with bespoke financing instruments and vehicles, such as other finance options mentioned. The purpose of the fund would be to act as a regional aggregator of opportunities, and as a platform through which public sector funds can be channelled to lever in private sector investments. The vehicle could also be a means by which to establish sovereign guarantees and targeted insurance products for high-risk adaptation interventions, including the transformational ones.

Integrated approach
The overall strategic portfolio is shown below. Together, this can unlock synergistic and integrated transformational solutions. The aggregation effect is also important, reducing transaction costs and helping scalability.
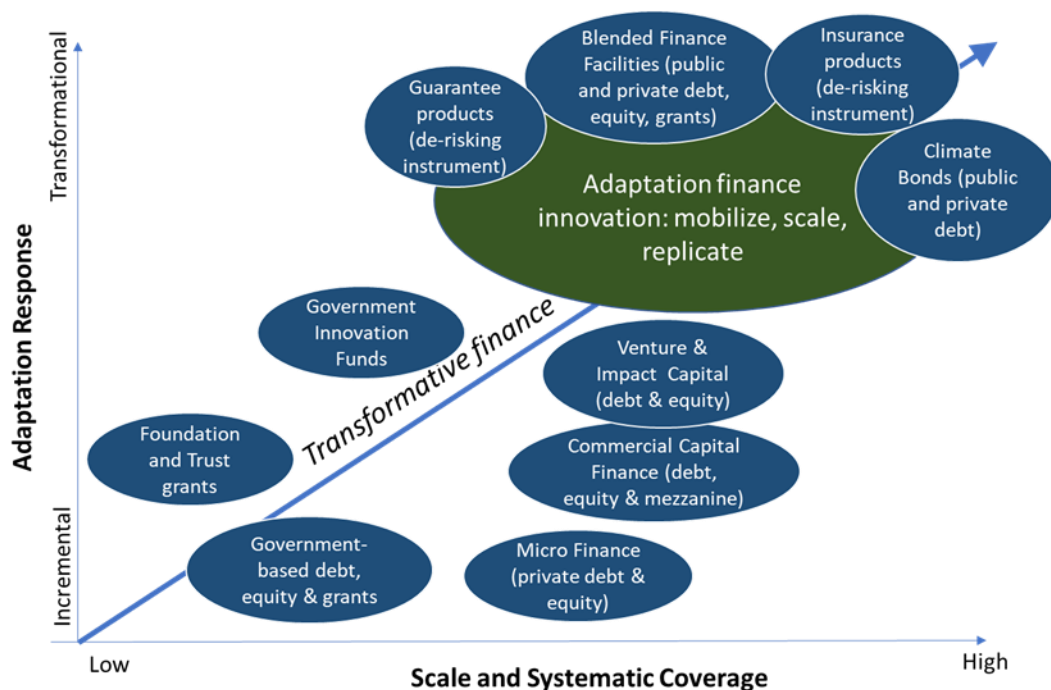
Figure 9: Adaptation finance landscape

The analysis above has been used to develop a delivery structure for transformative finance, shown below. This sets out the sources of potential finance at the top. It then shows how we propose to match the interventions in the Adaptation Strategy – including more innovative elements that will

be taken forward in the Portfolio Blueprint - to current and innovative finance. This will deliver the overall portfolio of incremental and transformational adaptation.
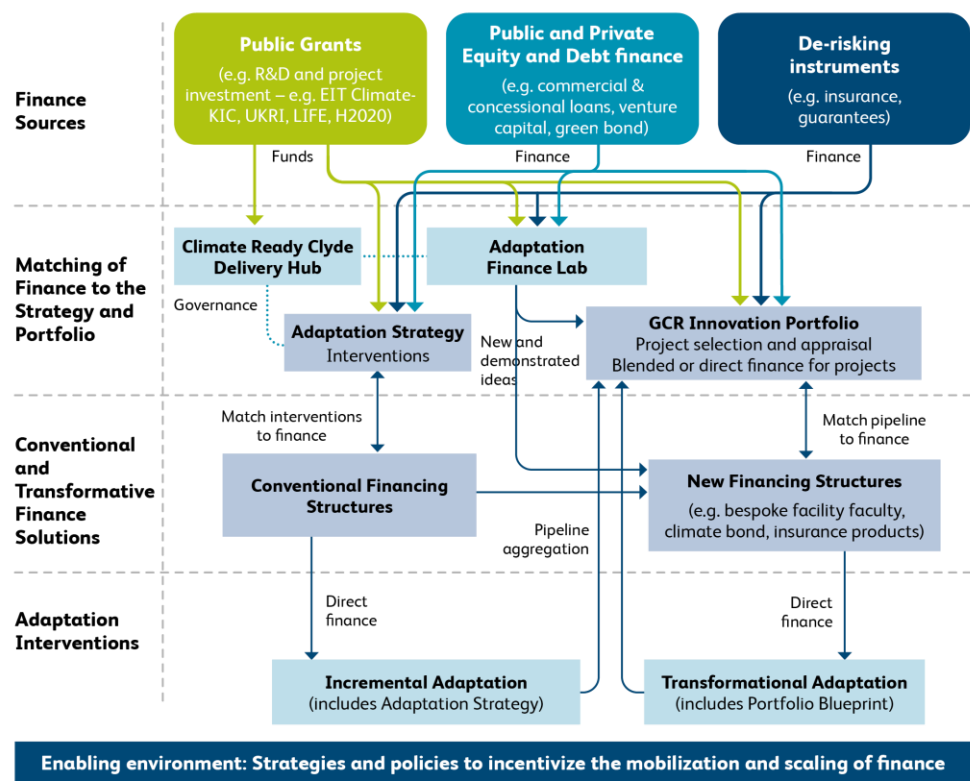

Figure 10: Enabling Environment: Strategies and policies to incentivize the mobilization and scaling of finance. Source: Clyde Rebuilt.

To take this forward, this will involve:

1)   Increasing the proportion of direct grants and creating the conditions for adaptation. There are some adaptation activities and investments that require (and justify) public intervention, notably because of market failures, or because they involve investments or changes where there is limited private sector interest. In these cases, public investment can support core adaptation, but there are opportunities to also use public funds to create the enabling environment for actions by the private sector and others.

2)   Encouraging public organisations operating in the GCR to move to a more commercial mindset. There are opportunities to use public funds or assets to support public-private sector partnerships or unlock investment from the private sector for adaptation. These opportunities could be very significant and can help to address the adaptation finance gap.

3)   Developing innovation for adaptation. There are many emerging opportunities for adaptation, and these can be developed through a cycle of innovation. This can be a pilot to demonstrate new approaches with new actors. This can be developed through partnerships including local research institutions and national and European research funders, local, Scottish and UK government, and the private sector. This would also position GCR as an innovation hub for the emerging adaptation economy, i.e. for new adaptation goods services.

In effect, we are proposing the use of an integrated financing approach that shifts away from the traditional silo approach. The intention is to use existing financial instruments in a complementary manner with more targeted financing solutions, including blended finance. This structure has considerable strengths in that it allows the region to cross subsidise between new financing structures and use traditional adaptation finance for the strategy and the innovation portfolio to help accelerate action. To help deliver this, there will be investment in the enabling environment i.e. the supporting strategies and policies for the mobilisation and scaling of finance.

Alongside the possible portfolio offerings, there is a need to develop a finance governance architecture. We therefore propose an Adaptation Finance Lab for GCR. The Adaptation Climate Finance Lab would be a platform to fund and encourage innovation in the Portfolio and its financing. The Lab would incubate and take to demonstration innovative ideas and provide a common 'meeting ground' for potential actors to collaborate in a structured and coordinated way. This would build on existing City Finance Lab support from other initiatives such as EIT Climate-KIC, Covenant of Mayors or CPI, with longer term, more targeted support and a better understanding of local conditions.

1.7 Next steps

Clyde Rebuilt has undertaken the relevant activities necessary to inform this Blueprint and in doing so, has laid the foundations to underpin an Innovation Portfolio for GCR which seeks to accelerate the pace and scale of adaptation in line with Climate Ready Clyde's and EIT-Climate-KIC's own ambitions for Transformation, In Time.

The next stage consists of moving from 'Frame' to 'Portfolio' stage, ensuring the practical mechanics are in place to activate and implement the approach in conjunction with Climate Ready Clyde. This will involve the following elements:

- Set up and creation of the Innovation Portfolio, including:
  - Creating the necessary enabling conditions for a Portfolio
  - Resourcing and coordination
  - Governance and reporting
  - Funding and capitalisation of the portfolio
  - Risk Management
- Creation of enabling conditions for scaling up of adaptation in GCR

Whilst this is an initial proposal, we will work with EIT Climate-KIC on the Stage Gate process, to ensure we have met the full set of criteria needed to launch the Innovation Portfolio.

Development and creation of the Innovation Portfolio

Creating the necessary enabling conditions for a Portfolio

In the exploration of Problem Spaces, we have identified two early Innovation Actions that are likely necessary for GCR to set up to increase the successful deployment of an Innovation Portfolio at scale.

- Adaptation finance lab – A mechanism for identifying new projects and supporting them to overcome financial and economic barriers
- A process for community empowerment and inclusion

Resourcing and Project Management

Our review of the finance landscape in Scotland has indicated that in the near term, the resource to develop, create, implement and coordinate the Innovation Portfolio will need to be supported by public revenue, but with a focus on crowding in and leveraging finance of others.

As part of our Financial Participation agreement with EIT Climate-KIC we are collaborating on applications to both LIFE-IP and the Green Deal call on Climate Resilient Innovation Packages for EU regions. These applications seek to pursue the Innovation Portfolio and implement two Innovation Actions which support our Problem Spaces and the key themes of culture, community empowerment, governance and finance. We are also in dialogue with the Scottish Government and UK Government on additional funding opportunities, including the Scottish replacement for EU Structural Funds, to help finance future plans and activities as part of the Adaptation Strategy and Innovation Portfolio.

We plan to convene a Focus Group, to bring together representatives of some of the finance community who have been identified in the Social Network Analysis as part of the Resource Mobilisation Plan, and potential partners and contributors to the Innovation Actions.

As our Portfolio Blueprint has progressed, we have gathered considerable interest from a wide cohort of different organisations and groups who can actively contribute to the implementation phase of the Adaptation Strategy and the Innovation Actions. On the latter, we would continue a process of co-design with these organisations to build momentum and mobilisation.

Management and Reporting

In addition to the resourcing, Climate Ready Clyde and Clyde Rebuilt will further consider and develop the governance and reporting arrangements needed to oversee the Portfolio process. An overarching approach would be the creation of a Portfolio Committee, to oversee the orchestration of a Portfolio and to design the call process reflecting the Positions/Problem Spaces.

This would likely need to contain a wide mix of skills and knowledge:

- Due diligence of investments and financial advice
- Awareness of the policy and regulatory environment and ability to change
- Knowledge of innovation approaches and market making

This presupposes a mix of partners from public, private and third sectors. EIT Climate-KIC will be an essential partner given their experience in Portfolio design and implementation in other regions.

Key steps in this process will be:

1) Identifying governance arrangements for the Portfolio amongst the wider GCR and national landscape.
2) Designing the membership and functions of an Innovation Portfolio Committee
3) Developing the Terms of Reference for the Portfolio Committee.

A key consideration will be whether the Portfolio Committee should be designed to administer funds (in which case legal advice will be sought on the type of body – e.g. joint venture, legal entity etc). This will require significant discussion with local and national stakeholders and likely adapting a version of this Blueprint into an HM Treasury 5-case business case.

It will also be important to clarify reporting arrangements, which is anticipated to include reporting to the Climate Ready Clyde Board, GCR Chief Executives/Cabinet, Clyde Mission and the Regional Economic Partnership. The Clyde Mission team of Scottish Government are shortly due to launch a mission on adaptation to climate change, and have already indicated that an Innovation Portfolio could serve as a useful approach to crowding in activity.

Risks

The Clyde Rebuilt team have identified a range of risks to the future development of the Portfolio. These are set out below:

Risk	Type	Likelihood	Impact	Consequences	Mitigation Actions
Failure to secure revenue and capital for the Portfolio	Strategic, Financial, reputational	High	High	Programme failure Limited scale and impact	Development of 5-case business case for Portfolio and adaptation finance lab Engagement with UK and Scottish Government
Failure to achieve success criteria of acceleration of adaptation	Strategic, operational	Medium	Medium	Increased exposure and vulnerability to climate hazards in GCR, and associated damages and impacts.	Development of 'success criteria' for fund, including adaptation criteria and wider socio-economic criteria
Failure of appropriate governance for Portfolio delivery	Compliance, reputational, legal	Med	High	Lack of appropriate governance for portfolio Inability to develop and scale funded activities	Open call for experienced directors to sit on a programme board / fund board Development of an advisory board for successfully funded activities
Lack of adequate skills (legal, financial, innovation) to support Portfolio development	Legal, financial, reputational	Med	High	Regulatory or compliance breaches, Failure to contract with individual projects Reduced credibility of Portfolio offering	Development of set of roles, competencies and skills required to manage a Portfolio.
Unanticipated event, outside the scope of the control of the project.	All	Low	Medium	Unknown – but could range from small to significant.	Keep risk register under review Conduct regular horizon scanning

Creation of enabling conditions for scaling up of adaptation in GCR

In addition to the direct creation of the Innovation Portfolio, we are focusing on scaling up broader adaptation action in GCR, through the LIFE-IP and Green Deal bids. This is important to create wider conditions which will continue to feed the Innovation Portfolio method and approach.

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Annex A – Collaboration Commitment

Forging A Climate Resilient Glasgow City Region: Clyde Re:Built Collaboration Commitment

This COLLABORATION COMMITMENT is made on 06.07.2020

BETWEEN AND AMONG:

(1)   Glasgow City Council, a local authority constituted and incorporated under the Local Government etc. (Scotland) Act 1994 and having its principal offices at City Chambers, George Square, Glasgow G2 1DU, as Lead Authority for and on behalf of the Member Authorities of the Glasgow City Region City Deal (**the Council**); and

(2)   Sniffer, a company registered under the Companies Acts in Scotland with company number SC149513 and having its registered address at Caledonian Exchange, 19a Canning Street, Edinburgh, EH3 8HE, on behalf of Climate Ready Clyde (**Sniffer**); and

(3)   CLIMATE-KIC HOLDING B.V., Kattenburgerstraat 7 1018 JA Amsterdam, The Netherlands (**Climate-KIC**);

(each **a Party** and together **the Parties**).

TERMS OF UNDERSTANDING:
The Parties

1. Climate-KIC Holding B.V. (herein referred to as Climate-KIC) was established by the

European Union's Institute of Innovation and Technology (herein referred to as EIT) in 2010. Climate-KIC is a large-scale public-private partnership which brings together and orchestrates a large and diverse community of innovators to help unlock the systemic changes needed to create the speed and scale of climate mitigation and adaptation action now needed. This community includes business and private sector, start-ups, universities, public bodies, educators, grassroots organizations and public bodies. We believe innovation comes from diverse sources.

2. Climate-KIC is an autonomous organization, established as an independent legal entity, owned by a representative body of its community.

3. Climate-KIC's vision is for a prosperous, inclusive, climate resilient society with a circular, net-zero emissions economy by 2050.

4. Sniffer is a sustainability charity which brings people and ideas together for a sustainable and resilient society. It provides the secretariat to Climate Ready Clyde, Glasgow City Region's regional climate adaptation initiative, made up of stakeholders from Glasgow City Region working together to ensure the City Region flourishes in its future climate. The initiative includes eight local authorities, the Scottish Environment Protection Agency (SEPA), Transport Scotland, Strathclyde Partnership for Transport (SPT), Glasgow and Strathclyde Universities, SGN and NHS Greater Glasgow and Clyde. As part of Clyde Re:Built, Sniffer is working with the cultural and climate change charity Creative Carbon Scotland and the specialist climate change and economic research consultancy Paul Watkiss Associates.

5. The Council is the Lead Authority for the Glasgow City Region City Deal, an agreement between the Scottish Government, the UK Government and the Member Authorities made on 20 August 2014 to provide £1billion of funding to the Member Authorities for investment in infrastructure projects in the Glasgow City Region. The Member Authorities are Glasgow City Council; Renfrewshire Council; Inverclyde Council; East Dunbartonshire Council; East Renfrewshire Council; West Dunbartonshire Council; North Lanarkshire Council: and South Lanarkshire Council. The Council is entering into this Collaboration Commitment on behalf of the Member Authorities.

Scope of Collaboration

6. The Parties wish to establish a collaboration on innovation to tackle climate change, where the Parties are working towards transforming Glasgow City Region to place it on a trajectory where it will flourish in its future climate by 2030, through the development of a portfolio of innovations in climate resilience, adaptation and societal transformation which systematically provide wider economic, social and environmental co-benefits.

7. In doing so, we will ensure these actions also play a key part in Scotland's ambition for a green recovery from the COVID-19, with the portfolio helping provide economic stimulus and job creation, and reducing systemic risks to shocks and stresses as well as building climate resilience over the longer term.

8. The Parties also recognise the urgent economic impact of COVID-19 virus, and the calls from the Committee on Climate Change, the Chief Resilience Officers Network and Cities and regions around the world to use the change for a green recovery. Therefore we endeavour to use the portfolio as part of a green economic recovery,

strengthening the resilience of Glasgow City Region's citizens, communities, businesses and institutions to a range of shocks and stresses, whilst creating jobs and helping in the short term to restart our region's economy.

9. The object of the Collaboration Commitment is also to set out the overall framework for such collaboration in terms of general context, timelines, technical areas and the conditions for changing or ending the Commitment. The collaboration takes the form of the Parties participating in Climate-KIC's *Deep Demonstration* Programme, where this is focused on creating showcases of the type of systemic transformation required to tackle climate change at the speed and scale needed. Cities, countries, territories, networks or businesses in the *Deep Demonstration* Programme serve as inspiration to others.

10. Deep Demonstrations involve a distinct approach to innovation – where this is deliberate, collaborative, mission-led and focused on creating a connected set of simultaneous interventions designed to unlock change in whole systems. Deep Demonstrations tackle multiple societal challenges in an integrated, holistic way.

11. The focus of the Commitment is to establish the basis for future collaboration between the Parties including in the following areas of priority action:

   - Ensuring people shape their lives and places so they are climate ready.
   - That the City Region's organistions, businesses, people and environment are made resilient by the way that resources, services and assets are directed; and
   - Ensuring actors collectively create the right conditions for Glasgow City Region to become climate ready.

12. These priority areas were identified in Climate Ready Clyde's Theory of Change for a Climate Ready Glasgow City Region, and were developed through significant stakeholder engagement as well as a best practice literature review.

13. In all cases, the portfolio of innovation should also identify how they can contribute to broader societal resilience against a range of shocks and stresses, such as pandemics, and support implementation of the Sustainable Development Goals.

   In that context, the Parties agree to:

   - Work together to support Glasgow City Region's own Deep Demonstrator project, (referred to as Clyde Re:Built);
   - Identify and engage diverse stakeholders to identify possible tests of change in the systems to be addressed;
   - Work together to design, establish and deliver a large scale fund for a connected portfolio of innovations; which crowds in further funding to address those levers of change with a view to creating transformational change;
   - Use the insights to develop the right enabling conditions (e.g. regulatory, policy or financial reform) which help accelerate and scale such action, such that all of Glasgow City Region is resilient to its future climate by 2030;
   - Work at the European and global scales, showcasing Glasgow City Region as a front-runner, and committing to building momentum as the Council

prepares to host the United Nations climate change conference in 2021, known as COP26;

- Actively learn from and respond do insights generated by other innovation projects and actors working towards societal resilience;

- Help to translate and transfer insights from the Glasgow City Region Deep Demonstrator Project, Clyde Re:Built, to other regions in Scotland and within the UK; and

- Monitor and assess progress on a regular basis.

14. The Parties expect to work towards finalising an outline of design of the portfolio of innovation activities by early 2021, and depending on resource availability, beginning implementation of the portfolio during that year.

Roles of the Parties

Climate-KIC can offer the following support to advancing Clyde Re:Built:

- **Use methods and toolkits for transformation:** Climate-KIC has a way of working, method and toolkits to support Challenge Owners in their efforts to tackle climate change by transforming whole systems. We call this systems innovation. We also have people to help Challenge Owners develop the mindsets and culture needed to work in new ways.

- **Identify sources of funding and design financial instruments:** Putting portfolios of innovation projects into practice often requires diverse funding sources. Climate-KIC has people and networks to help identify and access funding sources, and design financial instruments to support that portfolio.

- **Actively orchestrate the innovation portfolio:** Climate-KIC actively manages portfolios of pan-European innovation projects for climate impact. Through our Sensemaking and Portfolio processes we design, re-shape, build connections and extract learnings from innovation portfolios to set trajectories for impact.

- **The potential, subject to the Parties' future agreement, to manage the money to support multiple, connected innovation projects**: Climate-KIC is a trusted manager of funding for multiple innovation projects, with a long-track record of careful stewardship of money under detailed compliance regimes.

- **Measuring and evaluating progress**: Progress in transforming whole systems for tackling climate change cannot be measured with traditional monitoring and evaluation approaches. Climate-KIC has developed the latest thinking on how to measure progress – looking for early signals of systems change – that can be used to justify the approach to different stakeholders.

- **Bring the best of our network**: Climate-KIC has unrivalled access to a large community of innovators across Europe, each having tested ideas that could help the Challenge Owners i.e. the Glasgow City Region Cabinet and the Climate Ready Clyde partners to achieve their intent. Climate-KIC will help identify designers of innovative projects as well as those able to deliver innovative activities on the ground. We also have our own experts on innovative approaches to policy, technology, community engagement, finance and skills.

- **Accelerate learning across a group of Challenge Owners from other areas:** Climate-KIC is working with other Challenge Owners who share similar problems and aspirations. We can support learning across these groups in a way that helps a single Challenge Owners to get access to the latest insights and to not duplicate efforts (e.g. on developing the same technology).

- **Offer our knowledge and knowledge management platform:** Climate-KIC has a 10-year track record of gaining knowledge about what works in tackling climate change through innovation. We give access to that knowledge through our people and through an advanced knowledge management tool called Exaptive to help map and learn from portfolios of innovative actions.

15. Sniffer, both in its role as secretariat for Climate Ready Clyde, and more broadly, can offer the following support to advancing Clyde Re:Built:

- **Establishing the portfolio as a key priority in the forthcoming Regional Adaptation Strategy.**

- **Facilitating collective impact and collaboration in the development of the portfolio with the Climate Ready Clyde Board and other stakeholders –** including co-designing the scope, and undertaking funding bids and private sector engagement needed to capitalise the portfolio.

- **Providing technical assistance to develop wider adaptation action** – e.g. through development of projects and business cases, including drawing on knowledge and expertise from broader programmes, such as the Adaptation Scotland Programme and the Flood Risk Knowledge Exchange programme.

- **Building Glasgow City Region's adaptive capacity**, through training and skills development.

- **Leading adaptation action** across the region and beyond.

- **Helping showcase, scale and transfer the work,** through its broader programmes.

16. Glasgow City Region can offer the following support to advancing Clyde Re:Built by:

- **Committing to long-term support of the initiative for the next decade**, including adopting the Regional Adaptation Strategy and committing to a package of actions to support its development.

- **Providing access to expertise** in establishing special purpose vehicles and blended funding to share and manage risk and ensure funding reaches projects on the ground.

- **Identifying options to align the creation of the portfolio with existing regional development –** e.g. through Glasgow City Region City Deal.

- **Aligning broader regional development activity** to ensure all aspects of the City Region are working towards systemic, long-term resilience.

- **Levering regional networks to raise awareness of the demonstrator approach and maximise effectiveness and uptake –** e.g. through the Global Resilient Cities Network, C40, the Core Cities and the Scottish Cities Alliance.

- **Featuring the Clyde Re:Built in inward investment plans**, such as the

forthcoming regional investment prospectus.

- **Support citizen engagement, involvement and outreach** to maximise the transformative potential of the demonstrator.

- **Exploring financial mechanisms to enhance and scale the portfolio results** – for example through the use of Green Bonds.

Funding for Clyde Re:Built

17. This Collaboration Commitment does not constitute a commitment on behalf of any Party to contribute financial resources, whether direct or otherwise. Any financial commitment will require a separate formal agreement.

    The Parties wish to jointly identify sources of funding to execute the Clyde Re:Built. These sources may include, but not limited to public, private and philanthropic funding and finance. A tailored financial plan and financial mechanism will be developed during the initial phase. This plan will also include identifying funding for Climate-KIC's orchestration role.

18. We would expect that the budget needed to implement that first set of innovation projects within the portfolio (portfolio phase) would start from €10-15 million which is intended to implement between 2021 and 2023. This is expected to form part of work on the implementation of a 10 year transformation programme.

Confidentiality

19. All information in whatever form or mode of communication, which is disclosed by a Party (**Disclosing Party**) to any other Party (**Recipient**) in connection with this Collaboration Commitment during the continuance of this Collaboration Commitment and which has been marked as "confidential" at the time of disclosure, or which the Recipient can reasonably be expected to regard as confidential information, is "**Confidential Information**".

20. The Recipient shall:
    a. not, for a period of three years following termination or expiry of this Collaboration Commitment or the Recipient's withdrawal from this Collaboration Commitment, use Confidential Information otherwise than for the purpose for which it was disclosed and;
    b. not, subject to Clause 21, be permitted to disclose confidential Information; and
    c. use its reasonable endeavours to procure that its employees and any party to whom it discloses such Confidential Information in accordance with this Collaboration Commitment shall treat such Confidential Information as if it or they were subject to Clauses 19 to 23.

21. Clause 20 shall not apply to the following:

    i)   any disclosure made with the written consent of the Disclosing Party;

    ii)   any disclosure of information that is reasonably required for the performance of this Collaboration Commitment;

    iii)   any matter which a party can demonstrate is already or becomes generally available and in the public domain otherwise than as a result of a breach of Clause 20;

iv) any disclosure which is required pursuant to any law, judicial order or Parliamentary obligation placed upon the party making the disclosure or the rules of any or regulatory authority having the force of law or, if not having the force of law, compliance with which is in accordance with the general practice of persons subject to the governmental or regulatory authority concerned;

v) any disclosure of information which is already lawfully in the possession of the Recipient, prior to its disclosure by the Disclosing Party;

vi) any provision of information to the Recipient's own professional advisers or insurance advisers;

vii) any disclosure of information by the Council to any department, office or agency of the Scottish or UK Governments or their respective advisers or to any person engaged in providing services to the Council for any purpose related to or ancillary to this Collaboration Commitment;

viii) any disclosure for the purpose of:

(1) the examination and certification of the Council's accounts;

(2) any examination pursuant to section 6(1) of the National Audit Act 1983 of the economy, efficiency and effectiveness with which the Council has used its resources;

ix) any disclosure by the Council to any Member Authority or any City Deal partner or stakeholder; and

x) any disclosure made pursuant to Clause 22.

22. All information submitted to the Council may need to be disclosed and/or published by the Council. Without prejudice to the foregoing generality, the Council may disclose information in compliance with the Freedom of Information (Scotland) Act 2002 and/or the Environmental Information (Scotland) Regulations 2004, and the decisions of the Council in the interpretation and implementation of either shall be final and conclusive in any dispute, difference or question arising in respect of disclosure under their terms, any other law, or as a consequence of judicial order, or order by any court, tribunal or body with the authority to order disclosure (including the Scottish Information Commissioner).

23. The provisions of Clauses 19 to 23 shall apply from the last date of execution of this Collaboration Commitment and after its termination or expiry or any Party's withdrawal, howsoever arising.

Data Protection

24. The Parties will comply with the applicable requirements of Data Protection Law to the extent they apply to any activities under this Collaboration Commitment.

25. The Parties agree that it is their mutual expectation that they will not share personal data with each other under this Collaboration Commitment. In the event that, contrary to this mutual expectation, personal data is shared then Clauses 26 to 29 shall apply in the event that the Parties do not agree in writing any express provisions regulating such processing.

26. To the extent that any Party discloses personal data to another it will ensure that such disclosure is fair, lawful and transparent in the context of the purposes for which the personal data is to be processed by the receiving party and otherwise complies with the requirements of Data Protection Law.

27. Without prejudice to Clause 26, if any Party ("**Processor**") acts as a processor of personal data for another ("**Controller**") in relation to any activities under this Collaboration Commitment then:
    a. the Processor shall process such personal data only for the purposes of this Collaboration Commitment and subject to any express written instructions of the Controller from time to time, and otherwise on such terms relating to the processing as the Controller may reasonably specify in writing;
    b. the Processor shall assist the Controller in complying with its obligations under Data Protection Law and in demonstrating such compliance, including by documenting and agreeing in writing any particular aspects of the processing and providing such information in relation to the processing, to the extent reasonably required to do so by the Controller; and
    c. the provisions of Articles 28.2, 28.3 (a) to (h) and 28.4 of GDPR shall be incorporated into this Collaboration Commitment *mutatis mutandis* by way of direct contractual obligation on the part of the Processor to the Controller.

28. In Clauses 24 to 28:
    a. '**Data Protection Law'** means Law relating to data protection, the processing of personal data and privacy from time to time;
    b. '**Law**' means any statute, directive, other legislation, law or regulation in whatever form, delegated act (under any of the foregoing), rule, order of any court having valid jurisdiction or other binding restriction, decision or guidance in force from time to time; and
    c. words and expressions defined in Data Protection Law shall have the same meanings when used herein.

Miscellaneous

29. This Collaboration Commitment will have effect from the last date of execution hereof and shall subsist for a period of three years, unless terminated earlier by agreement of the Parties. Any Party may withdraw from this Collaboration Commitment at any time by giving three months' written notice to the other Parties.

30. Nothing in this Collaboration Commitment shall require any Party to commit any resources, whether financial or otherwise, or to enter into any agreement with any other party. Any commitments made in this Collaboration Commitment are subject to that Party's availability and approval of funds, delivery priorities and internal approval processes and procedures.

31. A person who is not a party to this Collaboration Commitment has no right under the Contract (Third Party Rights) (Scotland) Act 2017 to enforce or to enjoy the benefit of any term of this Agreement. Nothing in this Agreement, whether express or implied, is intended or shall be construed to confer, directly or indirectly, upon or give to any person, other than the Parties hereto, any right, remedy or claim under or in respect of this Agreement or any undertaking, condition or other provision contained herein.

32. No amendment to this Collaboration Commitment shall be valid unless recorded in writing and executed for and on behalf of the Parties.

33. No announcement or circular or other publicity in connection with the subject matter of this Agreement shall be made by or on behalf of any of the Parties without the approval of the other Parties as to its content, form and manner of publication save that any announcement, circular or other publicity required to be made or issued by any Party pursuant to any legal or regulatory authority may be made or issued by the Parties without such approval.

34. The Parties shall consult together upon the form of any such announcement, circular or other publicity and the other Parties will promptly provide such information and comment as the Party issuing any such announcement, circular or other publicity may from time to time reasonably request.

35. With the exception of Clauses 19 to 36, which the Parties agree are legally binding, this Collaboration Commitment is not legally binding and does not create any right or benefit, substantive or procedural, which may be enforced by or against any of the Parties or the Member Authorities.

36. This Collaboration Commitment and any dispute or claim (including non-contractual disputes or claims) arising out of or in connection with it or its subject matter or formation shall be governed by and construed in accordance with the Scots Law. All Parties submit to the exclusive jurisdiction of the Scottish courts.

IN WITNESS WHEREOF these presents are executed for and on behalf of the Parties as follows:

Climate-KIC Holding B.V.

………………………..

Name:
Position:Director, EIT Climate-KIC Holding B.V
Date: 06.07.2020
Place:

Glasgow City Council

………………..………..

Michelle Murphy
Legal Manager
Date:
Place: Glasgow

Sniffer

………………..………..

Name: Ruth Wolstenholme   :

Position: Managing Director

Date: 06.07.2020
Place: Edinburgh

"It's perfectly possible to be dead clear on where you need to get to, but not one-hundred percent certain on the best solutions for getting there.
Embracing this reality helps deal with the stress that comes with not knowing."
Cecilia Lopez, development strategist, Madrid

Definition: Reconnaissance is an activity of searching for 'what' actions you could take – looking for relevant projects, start-ups, technology developments, possible solutions, relevant relationships. In other words, looking for what is happening in the world out there that would help you experiment with changing a system from the particular position or set of positions you know you want to take.

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1. **Introduction**
2. **Portfolio Blueprint Deep Demonstration Activities**
3. **Channels of Inquiry:**
    - i)   **Input and Feedback from Stakeholders during the Portfolio Blueprint Deep Demonstration**
    - ii)   **Internal learning within the Consortium**
    - iii)   **Desk Based Research, including EIT Climate-KIC resources, Exaptive Tool, for wider discovery**

1. **Introduction**

Climate Ready Clyde had previously completed a Glasgow City Region Climate Risk and Opportunity Assessment[lvi] (GCR CROA) (CRC, 2018) which had identified approximately 62

climate risks and opportunities in the region, split across six themes. However, this had not applied systems thinking or the EIT Climate-KIC Deep Demonstration method and was thus focused on informing incremental adaptation.

The Deep Demonstration approach recommends focusing on a small number of major Problem Spaces. However, as found in the GCR CROA, a very large number of possible themes could be considered in the Deep Demonstration Pilot. For Clyde Rebuilt, two areas were selected.

A decision was made early on in the process, based upon an initial workshop with the Challenge Owners and as a result of internal inquiry and questioning amongst the consortium, to apply the Deep Demonstration method in a less-understood climate risk. Most of the historic focus on adaptation in Glasgow City Region has been on flooding, a climate risk with a complex and crowded existing political and governance landscape. It was decided that a novel approach, applying systems thinking, might therefore work better and get more buy-in, in a new area. **The first Problem Space selected was therefore around heat, health and well-being**. This was chosen because this risk has not been considered in detail to date in Glasgow City Region but will be important in the future. It also has an important linkage to the net zero transition, and requires system thinking because of the influence of the built and natural environment as well as the health and broader well-being domain. Our subsequent workshops with stakeholders tested the theme, with positive feedback, resonating well with stakeholders, demonstrating good potential for new inquiry in order to explore a wide range of complex issues reflecting a systems based approach.

The second area chosen was a cross-cutting theme, to move away from a hazards-based approach. There are several potential themes that could have been considered, but early work on adaptation for CRC (Watkiss et al, 2019[lvi]) identified the importance of finance, both as a precursor for incremental adaptation, but also the need to develop new types of finance. Not unique to Glasgow City Region, the theme is relevant more broadly, allowing good discovery of innovation elsewhere and a strong potential for replication in other regions. **The second Problem Space selected was around transformative adaptation financing**.

For the identified Problem Spaces and Positions, we have undertaken Reconnaissance to identify some of the research, projects and activities that have the biggest potential for innovation and transformative change. The Reconnaissance has also provided the opportunity to learn from experience elsewhere and to help advance and inform the Problem Spaces and Positions.
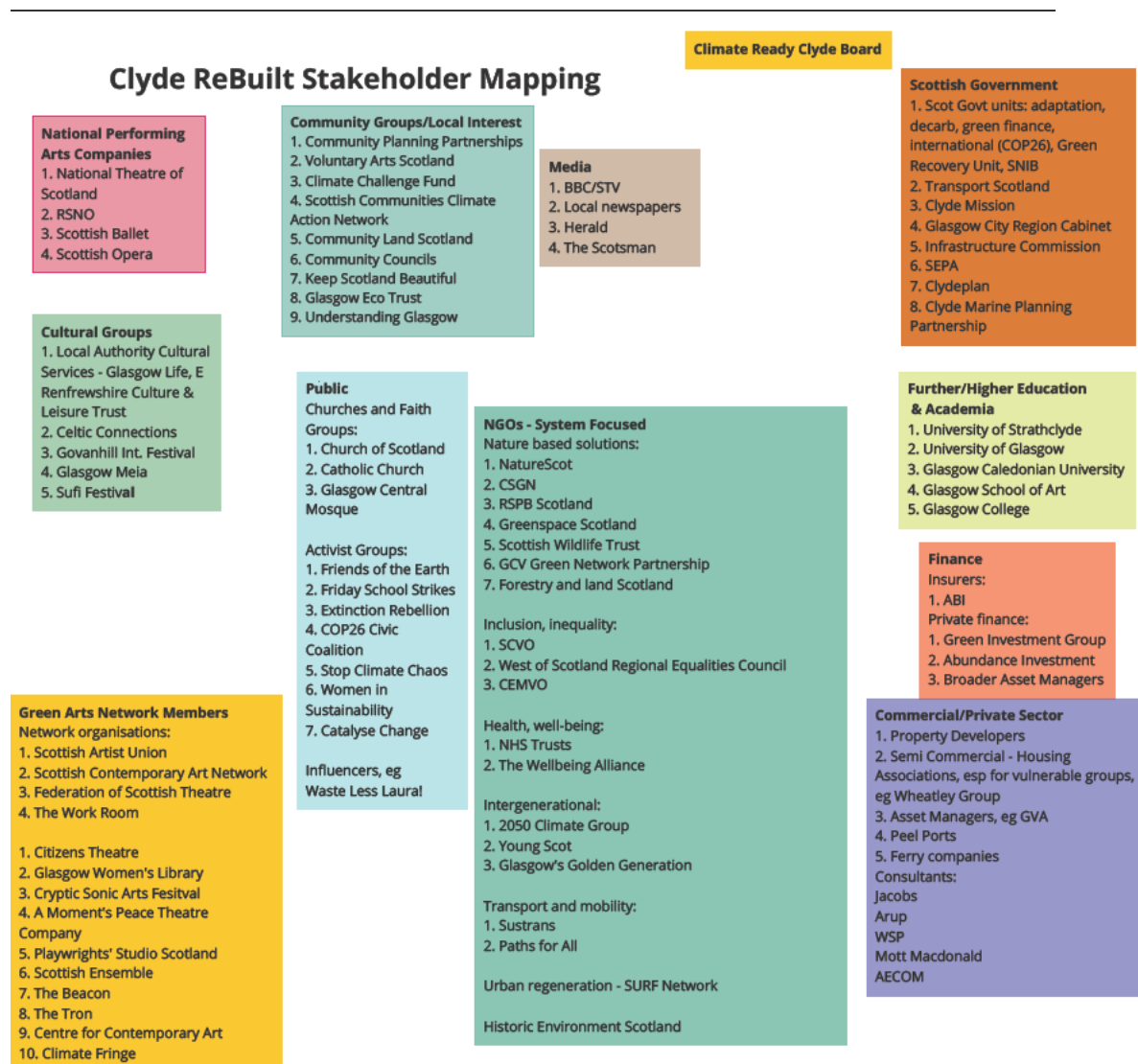
As well as ongoing exploration and inquiry with stakeholders as part of the Deep Demonstration methodology, we have pursued our own internal learning, using the specialist knowledge from Sniffer, PWA and Creative Carbon Scotland, as well as a review of existing projects from EIT Climate-KIC's Exaptive tool, and other resources. It has also drawn on background work on the review of the finance landscape in Scotland.

2. Portfolio Blueprint Deep Demonstration Activities

2020 Portfolio Blueprint Calendar

Date	Event/Activity
April, May, June	Early stakeholder identification and mapping, with support from IIASA (see Figure 1 below)
April, May, June	Early exploration of the types of systems mapping approach relevant to our needs
April, May, June	Early analysis and research of financial sources and mapping
April, May, June	Internal conversations to explore and define 'transformational adaptation'
May, June	Conducting series of bilateral semi structured interviews with Challenge Owners (see Table 1 below)
May, June	Conducting series of interviews with relevant funders, investors and financial experts
June, July	Two day workshop with CRC Board as Challenge Owners
July, August	Analysis of outcomes of the workshop, internal exchange, shared understanding of emerging themes, identification of extreme heat as a climate hazard, through the lens of health and well-being as an initial, first Problem Space
July, August	Analysis of relevant systems mapping and design
September	Workshop with public sector representatives and academics
September	Internal analysis of workshop outcomes and early identification of emerging Positions
September	Identification of the transformative adaptation financing as the second Problem Space
September, October	Engagement with GCR based cultural and creative arts organizations, prepare and co-design workshops, hosted by the organization
October	Workshop with community groups
October	Ongoing follow up, discussions and mini multi-laterals with workshop participants and other stakeholders to explore and validate Positions
November	Three workshops, hosted and led by cultural, creative arts groups, RIG Arts in Inverclyde, Glasgow Women's Library and Lateral North
November	Workshop with CRC Board as Challenge Owners to test and validate Positions

Clyde ReBuilt Stakeholder Mapping

Climate Ready Clyde Board

National Performing Arts Companies
1. National Theatre of Scotland
2. RSNO
3. Scottish Ballet
4. Scottish Opera

Community Groups/Local Interest
1. Community Planning Partnerships
2. Voluntary Arts Scotland
3. Climate Challenge Fund
4. Scottish Communities Climate Action Network
5. Community Land Scotland
6. Community Councils
7. Keep Scotland Beautiful
8. Glasgow Eco Trust
9. Understanding Glasgow

Media
1. BBC/STV
2. Local newspapers
3. Herald
4. The Scotsman

Scottish Government
1. Scot Govt units: adaptation, decarb, green finance, international (COP26), Green Recovery Unit, SNIB
2. Transport Scotland
3. Clyde Mission
4. Glasgow City Region Cabinet
5. Infrastructure Commission
6. SEPA
7. Clydeplan
8. Clyde Marine Planning Partnership

Cultural Groups
1. Local Authority Cultural Services - Glasgow Life, E Renfrewshire Culture & Leisure Trust
2. Celtic Connections
3. Govanhill Int. Festival
4. Glasgow Meia
5. Sufi Festival

Public
Churches and Faith Groups:
1. Church of Scotland
2. Catholic Church
3. Glasgow Central Mosque

Activist Groups:
1. Friends of the Earth
2. Friday School Strikes
3. Extinction Rebellion
4. COP26 Civic Coalition
5. Stop Climate Chaos
6. Women in Sustainability
7. Catalyse Change

Influencers, eg
Waste Less Laura!

NGOs - System Focused
Nature based solutions:
1. NatureScot
2. CSGN
3. RSPB Scotland
4. Greenspace Scotland
5. Scottish Wildlife Trust
6. GCV Green Network Partnership
7. Forestry and land Scotland

Inclusion, inequality:
1. SCVO
2. West of Scotland Regional Equalities Council
3. CEMVO

Health, well-being:
1. NHS Trusts
2. The Wellbeing Alliance

Intergenerational:
1. 2050 Climate Group
2. Young Scot
3. Glasgow's Golden Generation

Transport and mobility:
1. Sustrans
2. Paths for All

Urban regeneration - SURF Network

Historic Environment Scotland

Further/Higher Education & Academia
1. University of Strathclyde
2. University of Glasgow
3. Glasgow Caledonian University
4. Glasgow School of Art
5. Glasgow College

Finance
Insurers:
1. ABI
Private finance:
1. Green Investment Group
2. Abundance Investment
3. Broader Asset Managers

Green Arts Network Members
Network organisations:
1. Scottish Artist Union
2. Scottish Contemporary Art Network
3. Federation of Scottish Theatre
4. The Work Room

1. Citizens Theatre
2. Glasgow Women's Library
3. Cryptic Sonic Arts Fesitval
4. A Moment's Peace Theatre Company
5. Playwrights' Studio Scotland
6. Scottish Ensemble
7. The Beacon
8. The Tron
9. Centre for Contemporary Art
10. Climate Fringe

Commercial/Private Sector
1. Property Developers
2. Semi Commercial - Housing Associations, esp for vulnerable groups, eg Wheatley Group
3. Asset Managers, eg GVA
4. Peel Ports
5. Ferry companies
Consultants:
Jacobs
Arup
WSP
Mott Macdonald
AECOM

Fig 1. Early stakeholder identification and mapping, Clyde Rebuilt

Table 1: Initial representation of desired future system state and dynamics

Early semi structured interviews with Challenge Owners during May and June identified the following key critical challenges and opportunities:

Theme	Challenges and Opportunities
Institutional/ Governance	• Effective governance & leadership. Key actors and institutions are beginning to mobilize, offering strategic interventions, collaboration and inclusivity • **Climate Ready Clyde** provides the space for interconnections and coherence across our partners and board.

	• Climate Ready Clyde brings together different perspectives in a positive way and encourages a holistic approach. It brings collaboration which can be the multiplier we need.
Geographical/ Cultural	• The role of place, and our connection, relationship with it. The role of the river, region, through to local/neighbourhood level. • Current planning decisions and development along the river and flood plains are dysfunctional. • Make better use of sites along the river, including brownfield sites – often located near to busy neighbourhoods – make them accessible etc and invest in nature-based solutions with green networks and walkways. • Public and people are central to our relationship with the place and localities we live in. • There is a need to broaden out engagement with new and different voices, to build collaboration and start different types of conversations. • Helping to understand and raise awareness, not just to what we mean by adaptation, but through creative practices to talk about different perspectives of climate change. • Making sure people/communities are part of this process, fully inclusive of the plans that are made, and acting as co-creators. • GCR is all about the people within it and their identity and connection to it.
Framing/Technical	• Adding value through climate resilience, to break out of the traditional economic cycle. Supply chains, procurement, planning system, repurposing assets to add and bring value. Blue/green infrastructure
COVID-19 and Green Recovery	• COVID-19 is a game changer, comes in the midst of a climate and nature crisis • Now see shifting priorities: to develop a more resilient economy, with more stable jobs. Has exposed existing inequalities • Brings a wider set of 'whole system' opportunities that cannot be missed via the green recovery. • As we become more localised in lock down, spending more time in our neighbourhoods, perhaps now is the time to invest in them – local interests and local priorities. Also means we can re-purpose our cities, repurpose our assets to add value. • Is this now the opportunity for GCR to break out of the traditional economic cycle that has not served the region well? • We have followed London and other cities in previous economic crises, and have always been slow to reap any benefits. Do we need to take a different path – look to our previous industrial leadership and revive the entrepreneurial spirit.

3. **Channels of Inquiry:**
   i) **Input and Feedback from Stakeholders during the Portfolio Blueprint Deep Demonstration**

The Deep Demonstration process and inquiry with stakeholders informed Clyde Rebuilt's ongoing process, to prompt, stimulate, explore and test the potential areas for innovation and levers of change, from which to identify the emerging Positions. We applied an ongoing programme of bi-laterals and mini-multilaterals with stakeholders to continue to interrogate and validate our thoughts, findings and Positions, concluding with strong

endorsement. It is important to reflect that as our work developed with stakeholders and as the consortium further explored the Positions within the two defined Problem Spaces, a third Problem Space emerged in the later stages of the Portfolio Blueprint:

Problem Space 3: The huge potential for genuine community empowerment across GCR, can only be achieved by harnessing and mobilising the knowledge, influence, energy and agency of people and organizations working in their communities who are so far unfamiliar with and disconnected from the current narrow framing and discourse around adaptation.

The consortium plans to explore this third Problem Space further since it offers huge scope and potential for transformational adaptation. Plans for how this will be taken forward are set out in section 1.7.

An important reflection to share in our Reconnaissance is that the work and approach taken in Problem Space 1 is relevant to many other climate hazards, not just extreme heat. Further application of this method, together with a good understanding of what works, is relevant to explore a further Problem Space, around the issue of climate change and flooding in Glasgow City Region, i.e. which involves the combination of coastal, river and surface flooding, and requires a systems approach to address.

The issue of language, and assumptions around common terminology emerged as a recurring theme with stakeholders. Purposefully avoiding remote terms such as 'adaptation' and related technical climate terminology in our conversations helped to eliminate a sense of intimidation, exclusivity or authority, allowing more honest, open and fully participatory sessions. The term 'community' also came up, and what we understand by it. Often interpreted narrowly as local residents only, a number of stakeholders suggested to broaden its definition since there are many actors operating in a community. Broadening out the interpretation, to recognise all actors within a community, including businesses, private sector, public/local service providers, and not just local residents for example, can help to realise where innovation is possible.

ii) Internal learning within the Consortium

The Reconnaissance process of discovery, experimentation and seeking innovation was as much internal as it was external. The Clyde Rebuilt consortium comprises specialists in innovation, economics and finance, culture and governance, and as such the Clyde Rebuilt consortium represents a microcosm of the world at large and we believe that our success through our integrated and co-designed approach provides the foundation for this being amplified across the city region. For this reason, Clyde Rebuilt has benefited by fully maximising and exploiting an invaluable and unique mix of skills, knowledge and approaches to inform our ongoing, internal learning. As such, the process of co-design has been applied both internally and externally. Our ways of working with stakeholders,

general methods and workshop design have also been applied internally, to draw upon and benefit from different ways of conducting meetings and interactive discussions within the consortium. One example being the use and role of culture and creative practices to help us and our participants think differently. Refer to Deliverable 8, the Learning Exchange Report for more information.

The role of culture in achieving transformational adaptation

Credits: Bottom left – 'The Road Not Taken' from Moun-tain Interval by Robert Frost (1916).
Bottom right – (left) 'Birdcage' page from Sir Peter Max-well Davies' score of Eight Songs for a Mad King © Copyright 1971 by Boosey & Hawkes Music Publishers Ltd. Reproduced by permission of Boosey & Hawkes Music Publishers Ltd. Solely for the use of Creative Carbon Scotland; and (right) a slide from EIT Climate-KIC, 'Deep Demonstrations Design Process' (2020).

At every stage in the Deep Demonstration process, the consortium has sought to challenge, explore and interrogate its own internal learnings and to share and introduce relevant insights from its various areas of expertise. An example of which is shown below:

Thoughts about co-design in theatre, where the UK system of rehearsing plays has co-delivery built in.
Although theatre-making might seem unlike co-designing a transformational adaptation strategy it involves a diverse group of people collaborating to produce an original and innovative product by a fixed deadline.

Lessons from theatre	Application to co-designing an adaptation strategy

The more diverse the company, with different opinions, experience, skills and knowledge, the better and richer the production	Widen the stakeholder group to include communities, activists, media, financiers, public bodies, NGOs etc all with different knowledge, experience and ways of working
In theatre the first meeting is a 'read through': the first out-loud reading of the play at which everyone is present and which ensures that all are clear about the nature of the project: both where we are starting from and where we want to get to	Bring people together to hear *together* the plan, the starting point and the desired outcome
In the first stage of rehearsal the group jointly sketches out a 'map' so that everyone begins to understand their part in the journey towards the outcome; later stages add detail	Work together to create a jointly produced map of the journey – don't worry at this point about the detail – and recognise that it can be changed at a later stage when people know more: it's an iterative process
The job of the Director includes the following:	(The Director is effectively a 'knowledge broker')
• Representing the audience in rehearsal: watching and listening as they will do to make sure that what the company wants to put across is what the audience will receive and understand	• When not all stakeholders and beneficiaries of the project are or can be involved, keep them and their interests in mind
• Bringing on board people who know their jobs and roles well, then enabling them to do them effectively	• Widen the group and let them do the work!
• When necessary, making decisions to help the process move forward	• Leadership, not just listening, is required
• Thinking in advance about the fruitful routes of inquiry and debate but also the dead-ends, to provide reasons for taking certain decisions	• Do the research and be ready to share it in easily understood terms
• Creating a safe and well-organized space where people can disagree and debate without rancour to come to a richer and more informed outcome and have the time, plan and resources to work well	• Create a safe and well-organized space
• Encouraging the different perspectives to flourish rather than trying to reduce them: finding ways to enable the complexity to strengthen and enrich the whole rather than tear it apart	• Acknowledge and relish the complexity, Don't try to reduce it
• Recognising that as time goes on they will be less and less necessary: the company will do it themselves	• This is a process of giving away power, not holding on to it

iii) **Desk Based Research, including EIT Climate-KIC resources, Exaptive Tool, for wider discovery**

SLOW clean-up civic experiments

Location

Chicago

Description

This project aims to run experiments that are designed to restore derelict land sites that were previously occupied by petrol stations. The project uses phyto-remediation to enhance soil cleaning and aims to create environmental, economic, social and cultural benefits.

Partnership

A range of partners work on the project including the artist Frances Whitehead, City of Chicago Department of Environment, Chicago State University Biology and Geography Departments, School of the Art Institute Chicago, Purdue University Soil Science Researchers. One lesson learned from the partnership was the importance of building firm partnerships and stewardship plans capable of surviving changes of personnel in key organizations.

Relevant positions

5. Go where the cultural sector has enabled civic change locally and in the region:

The method for this project was developed by a local artist, Frances Whitehead, who used creative, in-process problem solving to assess alternative options for land remediation that had not been considered previously. Frances worked with communities and scientists. Another creative approach has been developed by this project, where a road building tool was re-purposed as a giant rototiller. This helps to keep the contaminated soils on site and out of landfill sites.

7. Go where community led activities and services connect with public sector services:

Embedding the artist into city government on this project helped to bring new perspectives and mindsets to the project.

8. Go where open and green space has been valued and invested in:

Phyto-remediation was a component of this project. This involved testing and using native plants to remove pollutants from soils to enable permanent removal of toxins and land regeneration.

The project created a Lab Garden which is used to test the removal of toxins and is visually appealing to communities. Improving the appearance and quality of the land also increases the land value.

Madrid: A city turning eco-fictions into eco-futures through systems innovation

Location

Madrid

Description

This project involved a cross-sectoral alliance using creative arts in a city-wide decarbonisation and resilience project. Current climate threats to the city include hotter summers, increased freak weather events and increasingly congested traffic. Madrid has developed a 360 Environmental Sustainability Strategy. The project has been using creative arts to work towards decarbonising the city. One example of this is helping residents to imagine what a low carbon city would look like (eco-fictions). The aim is to develop solutions to bring the eco-fictions to life and to help everyone to better visualise a low carbon future.

Partnership

Partners included city governments working with designers. The partnership had no hierarchy; all partners were equal rather than a top-down approach being applied. Everyone worked towards a shared vision. The partners of the project learned flexibility and responsiveness are hugely important. EIT Climate-KIC's partners shared the following learning: "Just because everyone starts on the same page, doesn't mean that circumstances don't change. Also, learning happens as the project evolves, and this should lead to tweaks and changes."

The article states working with uncertainty can be taxing. Partnerships tend to work according to a predefined strategy, but this project was different because it was felt this approach was too rigid to help address the climate emergency.

Relevant positions

1. Go where local capacity builders have contributed to transformational change in their communities:

The project worked to encourage residents to imagine low-carbon futures. This helped to increase understanding of the issues and increase participation in the project.

2. Go where there is innovation within and across governance systems and structures:

Governance approaches were changed to be more horizontal to move past 'business-as-usual'. The change to horizontal governance implies a different mode of working together and learning together.

3. Go where data is codesigned and socialised for adaptation:

The data for solutions is drawn from eco-fictions, which are based on resident's imagination.

5: Go where the cultural sector has enabled civic change locally and in the region:

The project used an artist residency to work alongside residents of an area of Madrid to re-envision the neighbourhood as an example of low carbon living. The artist, Ms Azuqueca asked residents to consider what a low carbon city would look like and how they might get there. She encouraged residents to use their imagination. Creative approaches were used to consider how the 'eco-fictions' can be brought to life and solutions developed. The project also integrated designers to help map systemic change and possible leverage points. A range of interventions were suggested including through finance, education, citizen engagement, regulation and creative arts.

7. Go where community led activities and services connect with public sector services:

The Madrid Government aimed to engage more citizens in decision-making. A small amount of the municipal budget is decided by public vote. A remaining challenge is getting citizens involved in designing and executing policies. Future ideas around this include framing climate change to be attractive and readily understood by the public, and finding more appropriate ways to engage citizens. The public want to see clear outcomes of their involvement.

Vienna's journey to carbon neutrality

Location

Vienna

Description

The city Vienna has developed a 'Smart City Vienna Framework Strategy' which forms part of 'Smart City Roadmap' and commits Vienna to being carbon neutral by 2040. This project worked with the Energy Planning Department of the City of Vienna to bring together a number of municipal departments and partners to align and expand climate initiatives to reduce emissions in Vienna's transport, building and heating, electricity and waste sectors. The project is looking at new ways of working to encourage more systemic, integrated and ambitious approaches.

Partnership

The project involved different municipal departments.

Relevant positions

1. Go where local capacity builders have contributed to transformational change in their communities:

The project is developing a participatory climate budget.

2. Go where there is innovation within and across governance systems and structures:

The city owns 220000 apartments and aims to shift heating from gas to heat pumps. It aims to encourage renewable materials and adapt the building code to incentivise green and photovoltaic roofs. The city is also working on 'superblocks' with reduced traffic and more open spaces.

6. Go where assets are defined and valued differently to create incentives for investing in the common good:

The project has estimated the carbon dioxide emissions from transport, building and heating, electricity and waste sectors to help build the economic case for decarbonising heating and electricity systems.

9. Go where Innovative combined mitigation-adaptation finance has supported transformational net zero and resilience projects:

The project is working on smart contracts and innovative funding to help finance the transition towards carbon neutrality.

Exploring frontiers in sustainability: Bringing futures literacy to financial services in Ireland and France

Location

Ireland and France

Description

Futures Literacy aims build capability within the finance sector to cure "poverty of imagination" that they believe constrains the ability to imagine a fundamentally different future.

This project aimed to:

- Generate new knowledge, meanings, concepts and framings for the financial services sector.
- Cultivate participants' expertise, developing their capability to use Futures Literacy through a tested design in 'learning by doing'.
- Establish key directions for next steps in the financial sector's ambition in general.

The project has focused on the financial sector because of its critical role in the climate crisis. This project states 'poverty of imagination' prevents people imagining a fundamentally different future and therefore imagine the impact of climate change. The inability to anticipate the future contributes to the pretence that climate change might not happen, leading to inaction. The project is looking at 'anticipation' as an idea to help deal with a lack of imagination in the finance sector.

Relevant positions

6. Go where assets are defined and valued differently to create incentives for investing in the common good:

The project is looking at how the finance sector is seen and valued, aiming to generate new knowledge, meanings, concepts and framings for the financial services sector, increase the expertise of participants and establish key directions for next steps in the financial sector's ambition.

Insights and opportunities from the project include the need:

- for systemic intervention
- to challenge definitions of value and value-creation
- for regulatory bodies to play a proactive role
- for the sector to generate disruptive innovation

Landscape finance lab

Location

The project is working in 17 countries.

Description

The background to the project is that land use contributes around 25% of greenhouse emissions. Despite this most green finance investments are targeted elsewhere in transport and infrastructure. This project suggests the solution requires land-based projects to be de-risked and made more attractive to potential investors.

The project developed an online platform to attract green capital for sustainable land initiatives and systematically refine products for broader applications.

Partnership

Partners on the project:

- South pole carbon asset management Ltd
- The Gold Standard Foundation
- WWF Austria

8. Go where open and green space has been valued and invested in:

This project aims to attract large amounts of green capital for sustainable land initiatives and systematically refine products for broad applications. It is helping stakeholders package together separate land initiatives into large products and launch projects with wider impacts. Landscapes can be transformed into sustainable, thriving and profitable ecosystems, which are protected and appreciated by humans.

10. Go where major public adaptation projects have been financed with non-grant models:

The project is implementing sustained, large-scale finance that shares the risk levels. It allows land managers to work on longer-term solutions and also makes projects more attractive to investment banks. Six of the Lab projects have invested $100 million.

WeBio

Location

Europe

Description

The project developed a platform to track biomass and optimise its use as a renewable resource. The platform has been designed for entrepreneurs and innovators at the local level to be able to assess and measure the regional biomass available to them. The platform provides information on four types of biomass: wood, by-products from crops for energy use, livestock effluents and sewage sludge.

Before this project tracking and repurposing biomass in Europe was underdeveloped. The lack of access to and existence of data about biomass was hindering commercial applications for biomass; it has the potential to help reduce emissions in the agricultural sector.

Partnership

Partners included:

- Engie S.A

- Fonazione Edmund Mach
- Open Foret

Relevant positions

8. Go where open and green space has been valued and invested in:

The platform is aiming to improve the management of bioresources for climate positive projects and optimise the use of biomass in order to minimise the environmental impact.

Carbon Farming

Location

France and Switzerland

Description

Carbon Farming is a landscape project that uses a systemic approach to increase soil carbon sequestration whilst considering the needs of multiple stakeholders and partners in the local context.

Relevant positions

3. Go where data is codesigned and socialised for adaptation:

Solutions were co-designed with local stakeholders.

8. Go where open and green space has been valued and invested in:

Carbon farming is an agricultural method aimed at sequestering atmospheric carbon into the soil. The aim is to define the changes needed at the farm and landscape level to sequester more carbon in agricultural soils.

The project is described as innovative because it is exploring the combination and connection of low-carbon practices with financial de-risking, monitoring, reporting and verification. The use of financial mechanisms beyond carbon credits is being explored.

9. Innovative combined mitigation-adaptation finance has supported transformational net zero and resilience projects:

The project is working on de-risking and guarantee mechanisms for farmers and businesses to change practices to sequester more carbon in soils. An example on this project is farmers in France receiving a carbon premium, set at 75 euros per tonne of carbon permanently fixed in the soil.

Participatory budgeting in Scotland

Location

Scotland

Description

The aim of the project was to help more people take part in decisions about how public money is spent in their communities. The project used a mix of participatory budgeting online and traditional engagement techniques to widen access and involve more people in decision making.

Partnership

The Democratic Society worked with the Scottish Government.

Relevant positions

7. Go where community led activities and services connect with public sector services:

The project has several recommendations for the most suitable tools for Scottish councils to encourage public engagement:

1. Dialogue - good for idea generation and discussion
2. Your Priorities - idea generation and prioritising projects
3. Open Active Voting - suitable for allocating funding to projects
4. Participare - voting to allocate funding to projects
5. Democracy21 - voting to allocate funding to projects
6. Zillino - co-production of ideas and in-depth deliberations

Artists and community landowners – telling the stories of Scotland's land in the hands of local people

Location

Scotland

Description

The project takes a collaborative approach to dig into the stories of community land ownership across Scotland and the impact it has had for communities. Stories of ownership are explored, including the effect for local people, their identity, decision-making and the economic and social benefits for their community.

Partnership

The Stove Network, in partnership with artists, Community Land Scotland and six Community Trusts.

Relevant positions

5. Go where the cultural sector has enabled civic change locally and in the region:

The project is working with artists who are using visual storytelling and collaborating with communities and individuals to capture stories of land ownership. The artists feel communities should have rights to their land but also ownership of their narrative. The aim is to create stories and work that speaks to a wide range of audiences to help develop projects that lead to real change.

8.Go where open and green space has been valued and invested in:

The project looks at stories around community land ownership with the aim of influencing future policy and practice.

Valuing arts and arts research

Location

NA

Description

This report discusses the role of the arts, artists and arts research in addressing complex landscape, environmental, and valuing nature research questions and problems.

Partnership

The report aims to trigger new thinking in doing research related to landscapes and environments by explaining how artists can operate as researchers, either independently or as part of multi-, inter-, and trans-disciplinary teams.

Relevant positions

5. Go where the cultural sector has enabled civic change locally and in the region:

The report discusses how artists can add value through using different fields of research, not just using one approach. The report states several roles for arts research:

1. Bring things to vision that would otherwise be overlooked or not recognised
2. Spark imagination, foster creative thinking, serendipity
3. Articulate messages between diverse groups
4. Reveal the value of disciplines to people
5. Provide a source of motivation
6. Reframe the issue at stake
7. Open up possibilities for political engagement
8. Reveal the value and agency of nature or place
9. Promote informed discussion, bridging disciplinary gaps
10. Suggest alternative ways of knowing and doing
11. Embracing uncertainty and complexity

6. Go where assets are defined and valued differently to create incentives for investing in the common good:

This report recognises the importance of non-scientific/objective forms of knowledge for dealing with issues of values, ethics and aesthetics. Arts research can be used to explore, understand and represent human action and experience.

Re-greening derelict coal-sites

Location

The reclamation sites are Mainshill and Blairhouse Scotland.

Description

The project involves two land reclamation projects on former coalfield sites. The aim is to create woodlands using confiners and a mix of broadleaf native tree species to increase carbon storage.

Partnership

Partners include:

- Scottish Mines Restoration Trust
- Forestry and Land Scotland
- Communities

Relevant positions

6. Go where assets are defined and valued differently to create incentives for investing in the common good:

The project will increase the value of the sites to communities, through increasing wildlife and by putting in footpaths and bridleways. The value for recreation is increased.

8.Go where open and green space has been valued and invested in:

The project mentions the mine site soils have been restored by the Scottish Mines Restoration Trust so that tree planting can now go ahead. The trees planted at Blairhouse will be registered with the Woodland Carbon Code to verify the amount of carbon stored.

Cities100: New York City – Engaging communities in climate change adaptation

Location

New York City

Description

New York city has two community adaptation projects that aim to prevent extreme heat events, extreme precipitation and coastal flooding from damaging housing. Community participation has been important in designing the adaptation solutions.

Partnership

East Side Coastal Residency and Hunts Point Resiliency are working with community boards, civic groups, tenant associations and business owners.

Relevant positions

7. Go where community led activities and services connect with public sector services:

Both projects rely on community boards, civic groups, tenant associations and business owners in designing the adaptation strategies and planning for these neighbourhoods. They are also using a range of participatory planning, such as stakeholder working groups, public workshops, public meetings and community task forces. Wider community engagement ensures the outcomes reflect the desires of the communities most affected by climate change.

Heat resilient cities: measuring the benefits of urban heat adaptation in Medellin

Location

Colombia

Description

This project aimed to use green infrastructure to reduce the urban heat island effect in Medellin. It is predicted the city will have 150 days above 29 degrees by 2040-2050. C40 and Ramboll have developed a tool to assess the potential of adaptation actions on urban temperature reduction to improve health of cities.

Relevant positions

1. Go where local capacity builders have contributed to transformational change in their communities:

The project has trained 75 locals from disadvantaged backgrounds to be city gardeners and planting technicians for planting green corridors.

6. Go where assets are defined and valued differently to create incentives for investing in the common good:

The green corridors are increasing value through positively impacting on citizens' lives. Interconnectedness and mobility has increased biodiversity. It has increased the aesthetics of the area as well as having health benefits.

8.Go where open and green space has been valued and invested in:

The project is developing green corridors to reverse urban heat island effect and pollution. 35 green corridors will be planting with 8000 trees.

Cuningar Loop

Location

The project is based near the River Clyde, Scotland.

Description

The project converted an area of derelict land previously used for landfill and mining into an accessible woodland park.

Partnership

Partners include:

- Forestry and Land Scotland
- Artists Rob Mulholland and James Winnett
- Clyde Gateway
- South Lanarkshire Council

Relevant positions

1. Go where local capacity builders have contributed to transformational change in their communities:

The project engaged local residents and had some elements of capacity building.

5. Go where the cultural sector has enabled civic change locally and in the region:

Two local artists were involved in the project to encourage local community involvement. Two artists worked to build trust with the local communities. Rob Mulholland produced a large sculpture at the park entrance which was developed through community conversations. Community workshops around sculpture-making also occurred and the community sculptures were placed in the park. James Winnett helped to raise awareness of the woodland park and the benefits it would bring. One of the lessons learned was: "the involvement of the artists was important in connecting the logistical work of creating the park with a more personal level, providing a pathway for community involvement in the project".

7. Go where community led activities and services connect with public sector services:

The project considered working with local residents very important to make sure the outcomes benefited them.

8. Go where open and green space has been valued and invested in:

Research on the project has shown access to green spaces helped to enrich the lives of the local community by improving air quality and opportunities for exercise. The area is now heavily used by local schools and nurseries.

Peat cultures

Location

Galloway, Scotland

Description

The project aimed to restore peat bogs near Galloway. Peat bogs are Scotland's largest terrestrial carbon store. Most peat bogs in Scotland are degraded. When peatland is disturbed, carbon is released into the atmosphere. Re-wetting peat bogs allows bog mosses and other plants to grow to protect carbon stored in the peat beneath them.

Partnership

Partners included:

- Crichton Carbon Centre
- Kate Foster, Environmental artist
- Galloway Glens Landscape Partnership Scheme

Relevant positions

1. Go where local capacity builders have contributed to transformational change in their communities:

The overall project aim was to support a range of local stakeholders in their work of restoring degraded peatland for a wide range of benefits. Community engagement and artistic activities were used to encourage people to consider peatlands as valuable in their own right alongside their importance for climate action and conservation.

5. Go where the cultural sector has enabled civic change locally and in the region:

Kate Foster, an artist, used artistic activities to engage local stakeholders in peatland restoration. One workshop at a Scottish Wildlife Reserve combined scientific and artistic perspectives and encouraged participants to think about the aesthetic, cultural and historic interests surrounding peat bogs.

8. Go where open and green space has been valued and invested in:

The project aims to restore peat bogs to help increase their carbon storage capacity.

Resilient city Vejle, Denmark

Location

Denmark

Description

Vejle has developed a resilience strategy for the city. It was the first urban resilience strategy to be developed in Europe. The strategy aims to understand the scope of potential future climate shocks and to understand how strengths of the region for adjusting to climate change can be leveraged to deliver value.

This project is a case study mentioned in the IIPP 'resilient regions reconnaissance report'[lvi]. The report identifies and tests assumptions or paradigms that currently influence how innovation is conceptualised and grand societal challenges are tackled. IIPP reviewed the deep demonstration projects to find paradigms. A summary of the paradigms is below:

1. Challenge the paradigm that mitigation and adaptation are separate, siloed approaches
2. Challenge the paradigm that resilience is too broad: "resilience approaches differ greatly by region, and resilience itself is too poorly defined to be a useful term".
3. Resilience can and should be defined through real-world applications.
4. Challenge the norm that future resilience is not included in many present-day metrics approaches and challenge the concept that market-fixing from public sector agencies is the only way to deal with this.
5. Support the paradigm that resilience can connect, build and equalise communities.

Partnership

The Resilient Regions Reconnaissance Report was produced by IIPP. The Municipality of Vejle worked to create the resilience strategy.

Relevant positions

2. Go where there is innovation within and across governance systems and structures:

The region is using a governance system to link to funding models.

4. Go where missing, marginalised actors have become mobilized and act as agents of change:

The strategy aims to address economic and social challenges through development of new partnerships and approaches. The strategy calls this 'resilience through co-creation'. The strategy created a foundation for improved strategic conversation through cross-sector projects and evaluating these projects against a joint vision in the long term. An example of aligning actors and different perspectives on different groups includes coordination with the housing policy steering group, council of education, innovation committee and other policy committed groups.

6. Go where assets are defined and valued differently to create incentives for investing in the common good:

A lesson learned on the project was:

"The strategy develops a shared mission around the nature of shocks and planning in an industrial area. It also develops the relationship between the strategy and a larger long-term vision of regional public value."

7. Go where community led activities and services connect with public sector services:

A fundamental pillar of this strategy is co-creation. Co-creation is used to increase resilience. The project has public-private innovation work.

10. Go where major public adaptation projects have been financed with non-grant models:

The funding models used aim to create multiple benefits in their resilience investments, which decreases and shares risk. An example is recreational space which also helps to prevent flooding.

Creating public value on the High Street: A mission-led vision for the future

Location

London

Description

This research report produced by UCL provides guidance on how public value plays a role in high street development. The report offered a 'mission-oriented approach', where a mission is defined as: 'a bold and ambitious commitment from governments to stimulate

cross-sectoral, bottom-up innovation to meet specific place-based environmental, social or economic challenges'.

Relevant positions

2. Go where there is innovation within and across governance systems and structures:

This article also provides a useful quote from Dan Hill, a professor and designer with IIPP about the need to develop new approaches with a focus on online approaches:

"One thing is clear: we cannot use the old tools to approach an entirely new challenge. The traditional methods of architecture, planning and urban design cannot move at the speed of Amazon, AI, or autonomous shuttles – or Extinction Rebellion, for that matter. We need to find new modes of engagement, and a richer array of toolkits and practices, to address the high street: prototypes, actions, acupunctures, all framed by a continual inquisitive reflection on what the high street is for".

6. Go where assets are defined and valued differently to create incentives for investing in the common good:

The report looks at a broad view of the high street rather than it just being viewed as shops and retail. The report states there is a need to consider the 'full high street ecosystem', which is the economic, commercial, social and environmental value.

7. Go where community led activities and services connect with public sector services:

The author of the report, Professor Mazzucato gives a nice quote in this article (taken from the report): "Understanding how to involve citizens both in the formation of missions and in public value planning and implementation, is key to making both citizens, and their high streets, more resilient and radical".

Natural water retention measures in the Altovicentino area

Location

Italy

Description

Two municipalities, Santorso and Marano Vicentino promoted the diffusion of Natural Water Retention Measures (NWRMS) to increase the resilience of the territory to flooding.

The area has been affected by flood events in recent years. Localised floods in urban areas occur as well as river overflows. Rapid urbanisation and soil use is increasing the problem. Local communities are unprepared for flooding events and are incapable of anticipating and mitigating the effects of climate change. The project aims to develop adaptation capacity to urban and rural flooding by involving local communities. The project is using small and affordable nature-based hydraulic measures (NWRMs) to increase infiltration and store rainwater.

Partnership

The leading organization is BEWARE. A key driver for the project was the long-term commitment of the municipalities of Santorso and Marano Vicentino in adopting sustainable solutions for rainwater retention and infiltration.

Relevant positions

1. Go where local capacity builders have contributed to transformational change in their communities:

An aim of the project was to initiate a participatory process involving all main stakeholders to identify shared actions and foster commitment to reducing flood risk. Implementing NWRM will help to increase water infiltration and water storage capacity to reduce flood risk in urban areas.

2. Go where there is innovation within and across governance systems and structures:

The project developed actions to improve local governance dealing with hydraulic resilience and safety. The project is using a participatory process with local administrators to update local building codes and to develop an inter-municipality action plan on hydraulic safety. The project is working on encouraging municipalities in the inclusion of provisions on and incentives for NWRMs in local building codes.

4. Go where missing, marginalised actors have become mobilized and act as agents of change:

A range of different sectors have been mobilized on this project: engineers, surveyors, architects, agronomists and foresters.

Mainstreaming climate change adaptation into urban planning: grey field land redevelopment

Location

Jena, Germany

Description

This particular project follows on from the development of a Jena Climate Adaptation Strategy. The overall project goal is to lay the ground for mainstreaming climate change adaptation into urban planning. Jena is exposed to climate change-related risks, particularly heatwaves. The project aimed to implement structural measures and nature-based solutions to address the urban heat island effect.

Partnership

Partners included:

- Helmholtz Centre for Environmental Research
- Department of Urban Development and Planning, City of Jena

Relevant positions

2. Go where there is innovation within and across governance systems and structures:

The Adaptation Strategy aims to mainstream climate change adaptation into urban planning. The project notes some challenges around this:

1. Climate change denial of relevant stakeholders including political decision-makers
2. Restricted budgets
3. Lack of experienced personnel
4. Lack of knowledge on external funding opportunities for adaptation actions.

8. Go where open and green space has been valued and invested in:

The project worked to redevelop a three Hectare area previously used for parking into a new campus for the Friedrich Schiller University. Economic assessments were conducted to determine the most suitable bundle of adaptation measures to reduce local heat risk and improve local climate. Three draft plans for development were ranked against multiple

criteria to explore different ways to shape the public area and its suitability of their design to promote climate change adaptation.

Adaptive restoration of the former saltworks in Camargue, southern France

Location

Salin-de Giraud, France

Description

The project aimed to restore a former industrial salt production site to a wetland area. The coastal area is 6500Ha and is within a UNESCO Man and Biosphere Reserve. When the area was used for salt production crystallisation ponds were used to extract salt. The water dynamics and ecological conditions were severely altered. The Camargue delta where the project is based is expected to be prone to flooding and coastal erosion.

Partnership

The project was led by the Research Institute for the Conservation of Mediterranean Wetlands.

Relevant positions

1. Go where local capacity builders have contributed to transformational change in their communities:

The project mentions the restoration project encountered resistance from some local inhabitants who did not accept the seafront dyke was abandoned. This highlights the importance of community engagement.

8. Go where open and green space has been valued and invested in:

Restoration of wetland helps to restore natural hydrological functioning, protect the coast from storms and improve biodiversity. The value of the area to communities increased through the use of eco-tourism and recreational activities.

Collaboration enables sustainable urban development in Lindängen

Location

Lindängen, Sweden

Description

This case study is from a report on sustainable urban regeneration. Urban regeneration is defined as 'a vision which leads to the resolution of urban problems and which seeks to bring lasting socio-economic, physical and environmental conditions of an area that has been subject to change'. The case studies in the report aim to show how physical and social strategies can transform whole areas into more attractive living spaces. Malmö which includes Lindängen has developed a long-term strategy to create a robust, sustainable urban structure for an increased population.

Partnership

Public private partnership between Trionon, a real estate company and 14 administrations within the municipality.

Relevant positions

2. Go where there is innovation within and across governance systems and structures:

Trianon, a real estate company is collaborating with the city. The collaboration involves 'social contracts' which includes things like employment of unemployed residents, jobs for young people and re-using old windows to build greenhouses for residents.

Success factors for sustainable urban regeneration identified were: a strong commitment from the public authorities, a well-adjusted combination of social and physical measures, the involvement and empowerment of the people living in the area and early collaboration between multiple actors with different expertise.

Developing a climate service to support adaptation to multiple water hazards in the municipality of Karlstad

Location

Sweden

Description

The case study is part of a brief looking at how co-designed climate services can support adaptation processes better by focusing on the needs of users. It can help to gain greater understanding of the challenges they face in making real-world policy decisions. In this example the adaptation challenge is flood protection. The area of the project is a dense, attractive residential area that is at risk of flooding. There was a need to work out how to adequately provide flood protection and what to prioritise.

Partnership

Data was codesigned between HazardSupport who ran the project, Stockholm Environment Institute (SEI), Swedish Meteorological and Hydrological Institute (SMHI) and the Karlstad municipality.

Relevant positions

2. Go where there is innovation within and across governance systems and structures:

One key message from the project was: "To deliver climate services that address stakeholder-specific needs and intended uses, providers and intermediaries must understand institutional and decision contexts."

3. Go where data is codesigned and socialised for adaptation:

In the project co-design of data focused on assessing how to provide flood protection, whether it would be an effective adaptation measure and where it would be best placed. The final climate model developed has helped the municipality in its appraisal process in advance of budget and implementation decisions. Another key message was "the co-design of climate services should better address the tendency for stakeholders to select and assess adaptation options one at a time, rather than considering multiple options." It was hoped that co-design approaches would better help decision-makers to address climate and non-climate related concerns and priorities. Overall, the project suggests co-

design processes may overcome common barriers, for example uncertainty in climate projections and policy priorities that compete with climate adaptation.

RAMSES (Reconciling Adaptation, Mitigation and Sustainable development for cities)

Location

Focal cities were Antwerp, London and Bilbao.

Description

This was a five year project focussing on climate change adaptation planning, including the calculation of climate change-related damage and adaptation costs. The background to this research was that the complexity and diversity of urban centres make climate change adaptation planning difficult to analyse and hard to compare between cities. The consortium developed analytical frameworks to help the implementation and measurement of adaptation strategies for cities.

Partnership

The project has a consortium of 13 partners across Europe.

Relevant positions

2. Go where there is innovation within and across governance systems and structures:

A lesson learned from the project was "It became obvious that a shift from pure technical and/or simple cost benefit considerations must occur, and that city stakeholders require a portfolio of options rather than one optimal pathway, with the empowerment of people being a fundamental   element in increasing the acceptance of climate change adaptation measures."

An output of the project included a database on resilient architecture and infrastructure indicators to help show key measures needed to improve urban design and make infrastructure resilient.

3. Go where data is codesigned and socialised for adaptation:

The project ran stakeholder dialogues to share and co-create the results on this project. The workshops allowed stakeholders to view the project results and provide feedback and comments that could be included in future activities.

Demonstrating the power of investments - investing in Atlantis to drive forwards renewable energy

Location

NA

Description

The investment company Abundance believes the climate emergency needs urgent action and is passionate about the shift towards clean, sustainable infrastructure. The company helps people to use their money to drive forwards positive change. Investments in the company Atlantis is an example of this, where responsible investment promotes mitigation through renewable energy development.

Partnership

Abundance customers and Atlantis.

Relevant positions

9. Go where innovative combined mitigation-adaptation finance has supported transformational net zero and resilience projects:

Investment in Atlantis has helped the company to develop a tidal stream project, MeyGen, which was the largest in the world in 2017. In 2017 MeyGen supplied 1 GWh of tidal energy to the grid and export 21 GWh. Financial investment allowed the company Atlantis to gain time and experience during the first stages of the project. Another renewable energy project that benefited from this investment was the purchase of the former coal power plant Uskmouth in Wales. Atlantis forms part of the SIMEC partnership which worked to convert the plant's capacity of 220MW to run on sustainable energy pellets made from organic waste and non-recyclable plastic.

Sustainable Landscape Partnership (SLP)

Location

North Sumatra, Indonesia

Description

The aim of this project is to provide a model for tackling global challenges such as climate change, deforestation, competition for agricultural lands and access to clean water whilst also improving economies.

Partnership

Partners include:

- USAID
- Walton Family Foundation
- Conservation International (CI)

Relevant positions

1. Go where local capacity builders have contributed to transformational change in their communities:

The project works with local communities to train farmers to improve the quantity and quality of key commodities such as cocoa, sugar palm and coffee. Farmers are also supported by improving access to transparent markets.

2. Go where there is innovation within and across governance systems and structures:

The project provides facilitation for decision-making in land-use planning and investments. CI are working with local governments to develop strategic environmental assessments to help support green development and inform spatial planning.

8. Go where open and green space has been valued and invested in:

The project aims to increase landscape resilience from diversification of agricultural products and through strengthening rural economies through improving market access.

9. Go where innovative combined mitigation-adaptation finance has supported transformational net zero and resilience projects:

SLP promotes sustainable finance to ensure long-term viability of investments and benefits to communities. The model used involves society and the private sector paying for services. Innovative low-emission business models are used to encourage further investment. The project works with private companies and corporate partners to increase global investment and demand for sustainable commodities.

The Greater Gola Landscape

Location

Sierra Leone and Liberia

Description

This is an example of a project that uses innovative methods to reduce the rate of deforestation in a key tropical forest area, whilst also providing economic benefits to communities for long-term financing. The project has established a Reducing Emissions through Deforestation and Degradation (REDD) project in Gola Forest.

Partnership

Partners include:

- RSPB
- Sierra Leone Government
- Conservation Society of Sierra Leone
- Local communities

Relevant positions

1. Go where local capacity builders have contributed to transformational change in their communities:

The project works with local communities to develop alternative livelihoods through sustainable cocoa farming.

9. Go where innovative combined mitigation-adaptation finance has supported transformational net zero and resilience projects:

Verified carbon credits can be purchased for the Gola REDD project that ensures carbon remains locked in trees and helps to support local people through sustainable livelihoods. Each year Gola REDD prevents deforestation and avoids the emission of half a million tonnes of CO_2.

In addition, the project attracts financing through the sale of Gola rainforest chocolate bars. Project partners are working with communities to develop shade-grown cocoa farmers to produce high-quality cocoa, which is made into chocolate available for sale.

The Copenhagen cloudburst formula: A strategic process for planning and designing blue-green interventions

Location

Copenhagen, Denmark

Description

Copenhagen is at risk from flooding due to cloudbursts. These extreme weather events could not be managed by conventional pipe systems. The project aimed to develop blue-green approaches to promote climate adaptation solutions within the limits of urban space. The project developed a six step procedure for integrating blue-green approaches.

Partnership

The project states the importance of a common vision between different districts: "Cities around the world can look to the Copenhagen Cloudburst Formula as a model for implementing innovative, pragmatic, feasible measures within existing urban fabric".

Relevant positions

2. Go where there is innovation within and across governance systems and structures:

The city developed a cloudburst toolkit to promote different multi-functional flexible adaptation interventions. Cloudburst solutions are included in local plans.

3. Go where data is codesigned and socialised for adaptation:

Public participation through workshops allowed citizens to actively shape their municipality's Cloudburst strategy.

4. Go where missing, marginalised actors have become mobilized and act as agents of change:

Synergy projects between municipalities, water utilities and philanthropists are encouraged to act as catalysts for development.

9. Go where innovative combined mitigation-adaptation finance has supported transformational net zero and resilience projects:

The city investigated and ranked areas for cloudburst investments to check the viability of them. The costs of doing nothing were estimate at between $60-90 million a year. A detailed socio-economic cost-benefit analysis was tested and it was found that the highest percentage of blue-green solutions and the least additional infrastructure pipe improvements led to 50% savings compared to pipe alone.

Nature-Climate Bond - The £1 billion challenge: route map

Location

Scotland

Description

The £1 billion challenge aims to develop and showcase cutting-edge investment and funding models for conservation, green jobs and greater resilience for businesses and communities. The solution discussed here is 'nature-climate bonds'.

Partnership

Partners include:

- Scottish Environmental Protection Agency (SEPA)
- Scottish Wildlife Trust

Relevant positions

1. Go where local capacity builders have contributed to transformational change in their communities:

This solution is working with communities to tackle the climate emergency and create lasting community benefits. It gives people the opportunity to invest in the nature-climate bonds.

2. Go where there is innovation within and across governance systems and structures:

The route map sets out an enabling framework to reach the £1 billion investment. Importance features of the road map include:

1. Policy coherence - coherence of Scottish Government policy
2. Advice and support: there is a need for mentoring, skills building, knowledge exchange, brokerage
3. Co-ordination of activities: coordinate different activities across different sectors

10. Go where major public adaptation projects have been financed with non-grant models:

One example listed is a nature-climate bond. The aim is to allow funding action on climate change and biodiversity loss with engagement from local residents. The Local Authorities issue the bonds to the public via a crowdfunding platform. The bonds issued are low-risk and easy-to-use. The bonds can be used to fund nature-based solutions, such as creation and enhancement of biodiverse green spaces, and urban drainage systems. It would help to provide habitat connectivity for biodiversity as well as mitigation, adaptation and resilience to climate change.

Vacant and derelict land fund - The £1 billion challenge: route map

Location

Scotland

Description

This is another example from the £1 billion challenge aiming to showcase cutting-edge investment and funding models for conservation and climate change through the £1 billion challenge. The solution looked at here is the 'vacant and derelict land fund'.

Partnership

Partners include:

- Scottish Land Commission
- Central Scotland Green Network Trust
- James Hutton Institute
- Scottish Environment Protection Agency (SEPA)

Relevant positions

8. Go where open and green space has been valued and invested in:

The Vacant and Derelict Land Taskforce is working to bring vacant and derelict land back into public use. The taskforce has identified 168 publicly owned sites that could be transformed for environmental and economic benefits. Restoration of some of these sites will provide communities experiencing levels of social, economic and environmental disadvantage with access to green space.

10. Go where major public adaptation projects have been financed with non-grant models:

Investors put money into restoration of degraded sites to transform them to profitable business opportunities that deliver biodiversity benefits. Some sites might be sold directly to investors for pre-approved green businesses. Another idea is to set up a commercial Vacant and Derelict Land Fund to allow site owners to attract investment in the remediation of identified sites.

Greening school courtyards in Paris

Location

Paris

Description

As part of 100 Resilient Cities, Paris plans to transform 800 school yards into green spaces by 2040. It is hoped that concrete school yards will have increased vegetation and shade coverage, alongside drainable concrete surfaces to absorb rain water. The goal is to use these green areas to provide respite in periods of extreme heat.

Partnership

Key people involved are Paris Chief Resilience Officer and the school École Riblette.

Relevant positions

8. Go where open and green space has been valued and invested in:

The green spaces will be opened up to vulnerable people to use outside of school hours. It is hoped this will also improve social inclusion within the city alongside the respite from the extreme heat.

Community purchase of land

Location

Newcastleton, Scotland

Description

Newcastleton and District Community Trust bought 750 acres of land for the community from the Duke of Buccleuch's Borders estate. It was one of the most significant buyouts ever seen in the south of Scotland.

Partnership

Funding was received from Scottish Land Fund and the land was purchased by Newcastleton and District Community Trust.

Relevant positions

1. Go where local capacity builders have contributed to transformational change in their communities:

The community plan to use the land to boost tourism, offer more housing, farm opportunities and provide renewable energy.

7. Go where community led activities and services connect with public sector services:

The chairman of Buccleuch estate, Mr Higgins provided a quote in a news article: "This is a very significant community buyout and demonstrates what can be achieved through people working shoulder to shoulder in order to turn hopes and dreams into reality."

Working with communities for public service reform

Location

West Dunbartonshire, Scotland

Description

A range of research activities were conducted to understand local priorities for public service reform. The research activities focused on place-based approaches and the themes of community engagement, evidence use and including vulnerable groups.

Partnership

What Works Scotland and Community Planning West Dunbartonshire.

Relevant positions

1. Go where local capacity builders have contributed to transformational change in their communities:

The project included a collaborative evaluation component, which aimed to support communities to be more sustainable, thriving and aspirational and improve service delivery. As a result of this activity, local partners addressed the issues raised, including reviewing timescales, building community relationships and providing staff training on engagement methods.

7. Go where community led activities and services connect with public sector services:

Several community led activities gathered research. One aim was designing meaningful and effective methods for dialogue and participation in community-led action planning. One activity drew out conditions to help support community-led approaches to action planning.

Generating case study evidence in Glasgow's Thriving Places

Location

Glasgow

Description

Thriving Places is a ten-year commitment with Glasgow Community Planning Partnership to address inequalities and achieve better outcomes for residents in nine neighbourhoods experiencing high levels of deprivation. What Works Scotland supported five local participants and one community activist to generate two case studies about the Thriving Places work.

Partnership

What Works Scotland, Glasgow Community Planning Partnership, six local participants and one community activist formed the case study development group.

Relevant positions

1. Go where local capacity builders have contributed to transformational change in their communities:

The case study development group provided participants with learning opportunities and the opportunity to reflect on each other's work.

7. Go where community led activities and services connect with public sector services:

A collaborative action research model was used to develop the case studies. Six participants from housing associations, health, cultural services and the local authority formed the case study development group. Some key learning points from the group include:

1. Ground rules were established to allow challenging conversations to occur
2. Meeting locations and times were made to be as inclusive as possible
3. The group had to learn in real time how to decide on case study topics and conduct ethical research.

Barcelona's radical plan to take back streets from cars

Location

Barcelona

Description

Barcelona city has developed an urban plan to create 'superblocks' where private cars are reduced and space is given to pedestrians and cyclists. The plan is to build 500 superblocks throughout the city. In 2016 the first superblock was built. One of the benefits of superblocks was to reduce noise and pollution levels.

Partnership

Each superblock is being implemented by a collaboration of local residents, local organizations and the City Council.

Relevant positions

1. Go where local capacity builders have contributed to transformational change in their communities:

Superblocks aim to have quiet, clean air and water, green spaces and develop communities.

8. Go where open and green space has been valued and invested in:

Public space is invested in through building superblocks and banning cars. Thousands of square meters of new shared public spaces have opened to residents as a result of the superblocks already developed.

Leuven 2030 roadmap for carbon neutrality

Location

Leuven, Belgium

Description

Leuven 2030 has launched a roadmap for achieving carbon neutrality by 2050. The roadmap includes indirect emissions in its goals and commits to achieving carbon goals in a socially just way that stimulates the economy.

Partnership

Leuven 2030 is an NGO founded by 60 members including local government representatives. Inhabitants, companies, civil society organizations, knowledge institutions and public authorities are represented. Leuven 2030 works to reduce carbon emissions using science, social power and storytelling.

Relevant positions

2. Go where there is innovation within and across governance systems and structures:

Leuven 2030 is a governance model that devolves responsibility away from the municipal authority for achieving carbon neutrality. The model for Leuven 2030 resulted from 18 months of discussion between five stakeholder groups: city government, citizen groups, knowledge institutions, companies and investors. It now claims to be the world's biggest organization with over 600 members. The governance model used is open and transparent. The model is described as horizontal because everyone is included. A range of actors feel ownership of the roadmap because of this horizontal approach.

4. Go where missing, marginalised actors have become mobilized and act as agents of change:

Leuven 2030 aims to include all actors in the system, not just the usual suspects. Everyone within Leuven 2030 is considered equals as partners. Everyone has a specific role and is valued for their unique contribution. An advantage of involving such as range of people is that the interventions in the roadmap cover the full spectrum of the city.

7. Go where community led activities and services connect with public sector services:

The Leuven 2030 NGO involved public authorities alongside citizens. They are taking a systems approach with widespread ownership for the roadmap to help deliver change.

Community-led marine biodiversity monitoring project

Location

Scotland

Description

The project aims to encourage everyone to get involved in surveying and monitoring of marine life in their local waters. The project has worked with communities to develop a 'how to' guide for community-led marine biodiversity survey and monitoring.

Partnership

The project was set up through NatureScot and Fauna & Flora International.

Relevant positions

1. Go where local capacity builders have contributed to transformational change in their communities:

The project is working to increase participation in marine biodiversity surveying in Scotland, improve survey skills and increase the knowledge base of communities.

3. Go where data is codesigned and socialised for adaptation:

The project supports community-led survey planning, fieldwork and data management. The data collected is input into national marine databases to support decision-making for Scottish inshore waters.

SURF: Rocking the Boat

Location

Scotland

Description

The impact of lockdown from Covid-19 has had the worst effect on people that have the least resources. North Edinburgh Arts and other charities and community groups worked together to deliver free, healthy meals, toiletries and cleaning supplies to vulnerable individuals and families in lockdown.

Partnership

The article is written by Kate Wimpress from SURF. SURF is a regeneration forum that works to address poverty in Scotland's disadvantaged communities.

Relevant positions

2. Go where there is innovation within and across governance systems and structures:

The group delivering meals had a collaborative framework that enabled them to deliver up to 15000 meals a week. Working with a range of partners meant the project had local, relevant information to help target resources to the right places. The hyper-local network formed here was replicated across the country. The hyper-local networks were quickly able to respond to the pandemic.

So Say Scotland

Location

Scotland

Description

So Say Scotland aimed to build networks of people and organizations through hosting assemblies and publishing analysis of innovative tools and methods for political

engagement. They promoted participatory politics and deliberative democracy. The project is no longer running. Relevant positions include:

- **1. Go where local capacity builders have contributed to transformational change in their communities.**
- **2. Go where there is innovation within and across governance systems and structures.**

Future Fenland

Location

Wisbech, NE Cambridgeshire

Description

As part of Anglian Water's organizational purpose to bring environmental and social prosperity to the region, four long-term ambitions have been set out to help the organization adapt to climate change. Future Fenland is a case study within the Adaptation Report. Anglian Water has worked to regenerate Wisbech through addressing social challenges, housing, transport and high flood risks. The Future Fenland project is described as ambitious, aiming to tackle the combined challenges of population growth and climate change. It aims to deliver increased resilience and long term growth in environmental and social prosperity.

Partnership

Anglian Water worked in partnership with Fenland District Council and organizations such as Business in the Community.

Relevant positions

2. Go where there is innovation within and across governance systems and structures:

The project uses a cross-sectoral task force combining public and private sector interests.

8. Go where open and green space has been valued and invested in:

The Future Fenland strategy is combining flood risk management, upgrading coastal defences with new reservoirs to boost economic growth alongside nature and tourism.

Stacey Abrams mobilising black voters in Georgia

Location

Georgia, USA

Description

Stacey Abrams mobilized a grassroots effort to encourage black voters in Georgia. Ms Abrams set up a group called the New Georgia Project focusing on registering and mobilising black voters. Previously Ms Abrams set up Fair Fight Action to tackle voter suppression and educate people about their voting rights. 800,000 new voters registered in the state, many of whom were African-American. The work of Stacey Abrams fits under **position 4. Go where missing, marginalised actors have become mobilized and act as agents of change.**

Creative Informatics

Location

Scotland

Description

"Creative Informatics is an ambitious research and development programme based in Edinburgh, which aims to bring the city's world-class creative industries and tech sector together, providing funding and development opportunities that enable creative individuals and organizations to explore how data can be used to drive ground-breaking new products, businesses and experiences."

Creative Informatics have five key areas, one of which is Challenge Projects. These aim to offer an opportunity for creative and cultural organizations to bring forward challenges

relating to their work that require innovative, data-driven solutions. Each challenge is advertised for a respondent to develop a solution.

Relevant positions

3. Go where data is codesigned and socialised for adaptation:

The Challenge Projects are relatively new, but a listed challenge on their website is with Children's Parliament. They use creative, participatory methods to support children from diverse backgrounds to express their views and experiences on being happy, healthy and safe. The challenge presented is to record, collate and analyse data Children's Parliament have gathered across their work, and present this evidence to children and adults across Scotland in a way that is engaging and understandable.

Resilient Regions:
Clyde Re**built**

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