Greater Manchester, UK 2020

Regional Circular Economy Status Quo

REDUCES – Rethinking Sustainable Development in European Regions by Using Circular Economy Business Models



REDUCES
Interreg Europe

European Union
European Regional
Development Fund

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1 Background and context

Circular economy changes the methods and revenue models of business. Instead of traditional ownership, consumption is based on the use of services: sharing, leasing and reusing. The new method challenges countries and regions to develop and construct new business models that can be used to respond to the global climate crisis, among other things.

REDUCES contributes to the EU2020 strategy by advocating the priorities of Sustainable, Inclusive and Smart Growth. In addition, improving resource efficiency by sharing experiences on circular economy practices will translate into lower GHG emissions and give a much-needed boost to economic growth in the regional context. The project will also contribute to the vision of "Resource-efficient Europe" via inter- and intraregional cooperation and learning processes. This kind of interaction is vital in order to reach the EU2020 strategy goals. REDUCES also supports the fundamental objectives of decoupling economic growth from the use of resources and increasing the use of renewable energy sources which are underlying themes in the EU2020 strategy. The EU action plan of the circular economy also accentuates the need to create the conditions under which a circular economy can flourish and resources be mobilised. It is recognised in the plan that new business models are needed to enable us to rethink our ways of producing and consuming.

REDUCES brings together six European regions:

- Southwest Finland
- Utrecht, Netherlands
- Greater Manchester, UK
- Valencia, Spain
- Bulgaria
- Maramures, Romania



The overall objective of the project is to improve the implementation of regional policies in order to enable regions to adopt more environmentally sustainable ways of production and to reduce the negative environmental impacts of economic development. Circular business models can be used to help companies achieve resource efficiency and subsequent net revenue gains, and by doing so help regions achieve a more innovative, resilient and productive economy. Although circular

business models are often viewed as sustainable by nature, it is recognised that there are uncertainties about their potential impacts, such as externalities and rebound effects. REDUCES results will facilitate and better enable the adoption of environmentally sustainable circular business models with the support of improved regional policies.

Sub-objectives of the REDUCES project are:

1. To increase the knowledge and capacity of regional and European policymakers and stakeholders on circular economy business models
2. To improve the competence of partners and involved stakeholders to make informed decisions on promoting the transition to the circular economy in regions
3. To discover innovative and the most feasible circular economy business models in each region, which are instrumental to transforming production value chains towards environmental sustainability
4. To improve the competence of regional actors to assess the environmental impacts of circular economy business models in order to choose the most feasible and environmentally sustainable models recognizing regional assets, barriers, needs and strengths necessary for the circular economy transition
5. To improve policy instruments (4 ERDF policies and 2 regional plans) via 6 action plans to better introduce or integrate circular economy business models into the policy instruments and supporting the theme by proposing new project ideas or funding.

The purpose of this Status Quo report is to summarize the results of the studies carried out about the existing circular economy business and actions, strengths, opportunities, threats and weaknesses in Greater Manchester, the United Kingdom. The Status Quo report provides the basis for the development work planned in the REDUCES project.



2 Definitions and methods



2.1 Circular Economy

"Circular economy" can mean a lot of different things in different sectors. Common denominators include designing out waste and pollution (reduction of waste), keeping products and materials in use (quality improvement and value retention), regenerating natural systems (loops, transition) and social aspects, such as creating well-being (Ellen MacArthur Foundation 2017b).

A circular economy refers to an economic system that is based on business models that replace the current linear economic model. These business models replace the conventional model with reuse, recycling and alternative production, distribution and consumption processes. A new business context aiming at sustainable development requires extensive action at several levels, ranging from the micro-level (products, businesses and consumers) to the meso-level (eco-industrial parks) and even up to the macro-level (cities, regions, states and even more extensive entities). All of these share a common view and goal of more sustainable business that takes into account the environment, economic well-being and social justice at different operational levels (Kirchherr et al. 2017, 224–225).

According to the Ellen MacArthur Foundation, the aim of a circular economy is to look beyond the current take-make-waste extractive industrial model. The idea is to gradually decouple economic activity from the consumption of finite natural resources. At the same time, the amount of waste is reduced and finally it is designed out of the entire system. The focus is on positive, society-wide benefits. The circular economy builds economic, natural and social capital, supported by the transition to renewable energy sources (Ellen MacArthur Foundation 2017b). The Finnish Innovation Fund Sitra defines the circular economy as a future economic model in which natural resources are used within the Earth's carrying capacity (Sitra 2019a).

Based on the knowledge and understanding of the REDUCES project partners, the circular economy refers to socially sustainable business that creates well-being. The objective of the economy is to maintain and restore the value of our natural resources. Even though the objective is full circulation, the number and level of loops can vary. The transition to a circular economy, as well as business in a circular economy, requires extensive cooperation between different parties.



2.1 Circular economy business models

The corporate world is shifting from the traditional model of a linear economy towards a circular economy. In the circular economy, production and consumption are increasingly based on services instead of owning. The operating methods and

earning models of companies change, and operations need to be updated so that they will support the mitigation of climate change (Sitra 2019b).

The themes of the circular economy business models investigated in the REDUCES project are based on the definitions of the Finnish Innovation Fund Sitra. The themes are renewability, sharing platforms, product as a service, product-life extension and resource efficiency and recycling (Sitra 2019a).

The circular economy business model is an economic model in which business is largely based on the forms of business mentioned above, i.e. consumption is based on the use of services – sharing, renting and recycling – instead of owning and increasing production of goods. Materials are not destroyed at the end but used over and over again for making new products (Sitra 2019a).

Design plays a crucial role in ensuring that products are durable and environmentally friendly and that the materials can be reused at the end of the product life cycle. The circular economy requires us to redesign our ways of working: our products, business models, cities and the linear systems that have lasted for the past centuries. Choices made at the start of the life cycle have impacts on each phase during the product life cycle (Ellen MacArthur Foundation 2020a).



2.3 Multi-stakeholder governance model

The multi-stakeholder governance model is a governance structure that comprises institutional ways of involving non-governmental actors, i.e. internal and external stakeholders in the dialogue, decision-making and implementation of solutions to common problems or goals. It relies on the principle that if enough input is provided by all actors involved in a question, the eventual consensual decisions gain more legitimacy and therefore better reflect the set of perspectives rather than a single source of validation. Unlike in multilateralism, in which governments, as representative of their citizens, take the final decisions on global issues and direct international organizations to implement them, in multi-stakeholderism stakeholders become the central actors. Multi-stakeholderism often disconnects decision-making and the implementation of these decisions from the interngovernmental sphere, having no obligation to either report to or take instructions from the interngovernmental community (Lin 2018, Gleckman 2018, Szuppinger & Kállay 2017).

In the REDUCES project, the multi-stakeholder governance model appears in involvement and engagement of the stakeholders from the different sectors and levels in all the regions in the project. Circular economy is not an individual game, and this gives a crucial role to wide cooperation between different stakeholders. Involvement appears in different ways for different project regions depending on the policy instrument and its role and activities in the field of business and circular economy activities.



2.4 Policy instrument

In general, a policy instrument is a means for public intervention in local, national or international economies, referring to any policy, strategy, instrument or law developed by government/public

authorities and applied on the ground in order to improve a specific territorial situation. Policy instruments are linkages between policy formulation and policy implementation, intended to achieve outcomes which conform to the objectives of public policy. They can take many forms, ranging from regulatory régimes to the provision of services to help improve the performance of businesses, and in most cases, financial resources are associated. However, an instrument can sometimes refer to a legislative framework with no specific funding (Interreg Europe 2020, Saublens 2012).

Policy instruments are often known as governing tools as well, particularly when they are applied to all conditions associated with them. The implementation of governing tools is usually meant to achieve policy targets of resource management but adjusted to social, political, economic, and administrative concerns. Concerns of sustainability largely depend not only on what instruments are selected but also on how they have been applied. Assessment of policy instruments can therefore be an important component of policy sustainability (Ali 2013).

In the context of Interreg Europe, "operational programmes for Investment for Growth and Jobs as well as Cooperation Programmes from European Territorial Cooperation are considered policy instruments. Beyond EU Cohesion policy, local, regional or national public authorities also develop their own policy instruments. Macroregional strategies can also be considered policy instruments in the context of Interreg Europe. However, considering the characteristics of these strategies, it may be easier for projects to influence the corresponding transnational cooperation programmes than the macroregional strategy itself" (Interreg Europe 2020).

3 Regional Circular Economy Status Quo: Greater Manchester

3.1 Main features of the city region

The Greater Manchester (GM) economy covers the 10 local authority areas of Bolton, Bury, Manchester, Oldham, Rochdale, Salford, Stockport, Tameside, Trafford and Wigan, and is located in the heart of North West England. This City Region's population has grown by 240,000 since 2000 to 2.8 million people. The GM is a key contributor to the UK economy, delivering 40% of the total output in the north-west through 1.4 million jobs (Greater Manchester Spatial Framework (GMSF), 2019) across 122,000 businesses. Currently, the GM economy is worth €72.6 billion, or approximately £65.7 billion. Despite GM's global reach and ambition, the city maintains its distinctive and independent character based on inclusion and quality of place for its residents, providing an affordable location in the UK for innovative and pioneering organisations to develop industries of the future (GMSF, 2019).





Manchester city centre skyline.

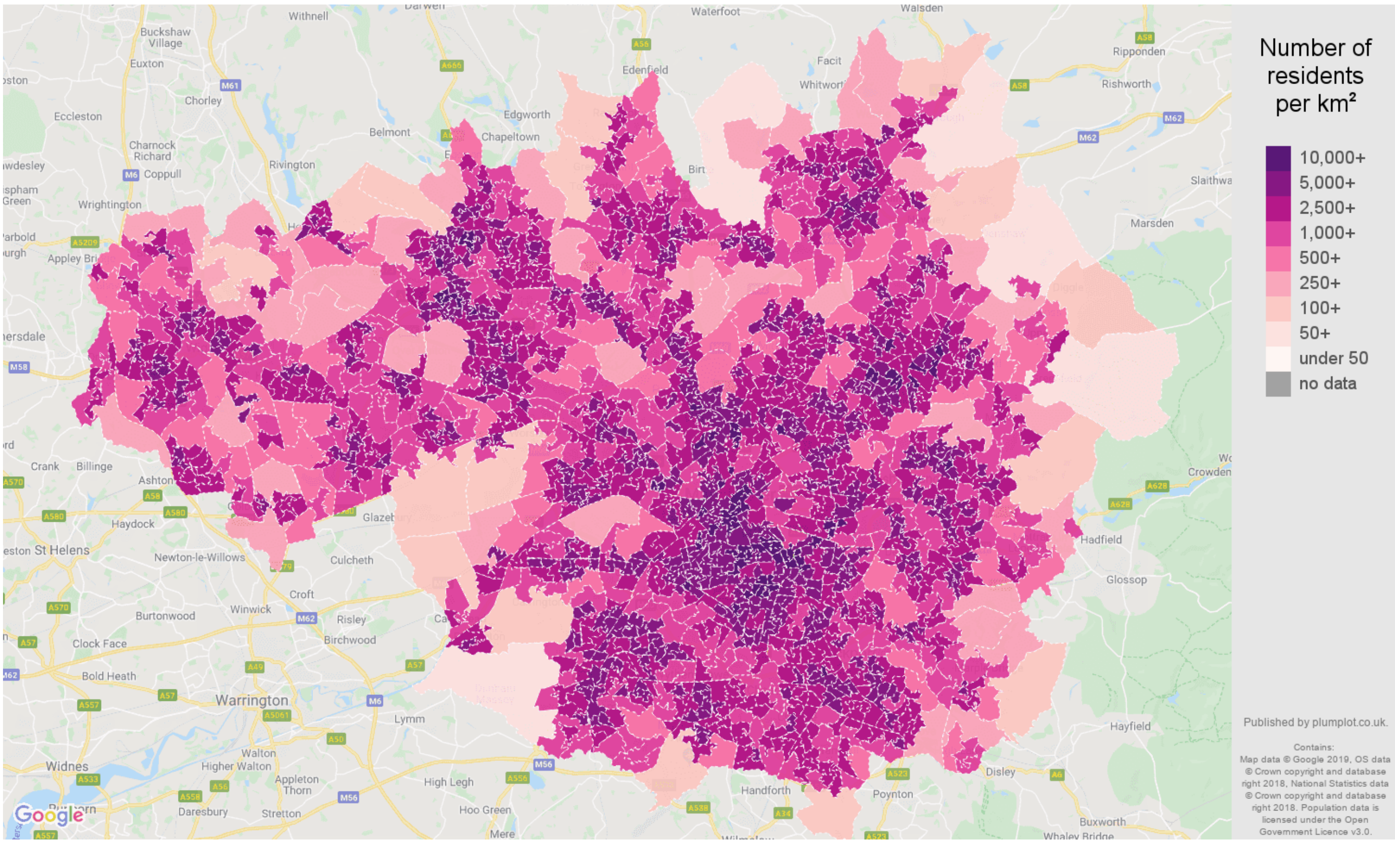


Figure 1. The number of residents per square kilometre.

One point that is particularly distinctive about GM, compared to European counterparts is the City Region's high population density of 2200 per km2 (Plumplot, 2018) nearly 8 to 9 times our European counterparts, with areas of high-density up to 5-10,000+ spanning across the conurbation as illustrated in Figure 1. Population density is important in the transition towards a Circular Economy and targets for household waste which will be explored later in the report.

Though the economic output of GM is significant, there are evident disparities in the City Region between local authority areas, such as Manchester, Trafford and Salford, which accounted for 82% of the growth in employment between 2001 and 2016. Moreover, only 32% of GM residents aged 16–64 are educated to degree level or higher (compared with 36% in the UK), and 10.6% have no qualifications (9% in the UK). Unemployment stands at 7.3%, with 47,200 residents claiming unemployment benefits (26,800 Jobseeker's Allowance and 20,300 Universal Credit), and over a quarter of all children living in GM are living in poverty. Furthermore, Oldham, Salford and Rochdale have been highlighted as some of the most deprived areas in the country (ONS, 2016) (GM-EU Investment Plan, 2016). These disparities create challenges in terms of developing economic growth and prosperity for the City Region while ensuring that the benefits are shared equally across each local area (GMSF, 2019) during the transition to a zero-carbon economy by 2038 (Greater Manchester Environment Plan (GMEP), 2019).



Figure 2. A map of the 10 Metropolitan Boroughs in GM and circled area of Oldham.

Oldham, circled above in red to the North East of GM, forms a central focus of this report, as a partner of the project, but also an exemplar Metropolitan Borough local authority area due to its combination of above average levels of deprivation and ambitious green growth plans proposed in the Green New deal strategy for environmental, social and economic development (Hunt, 2020).

GM's reputation as the first industrial city stems from the conurbation's global influence in textile manufacturing and its role in creating some of the world's first global supply chains. Being at the fore of the industrial revolution brings a level of responsibility and accountability in relation to developing a cleaner green economy. Andy Burnham, the Mayor of GM, has acknowledged this issue, highlighting GM as a leading contributor to greenhouse gases (GMEP, 2019). Responsibility was echoed by the Director of Low Carbon for the GM Growth Company (2020), who described GM's moral obligation to develop a cleaner economy arising from the city's role in the industrial revolution.

The Greater Manchester Combined Authority (GMCA) was formed as part of the devolution process in the UK. It includes the 10 Metropolitan Borough local authority areas (listed above and shown in Figure 2), all of which have an equal vote, in addition to the mayor. In November 2015, in developing proposals for devolution of central government powers to the GMCA, the Government published a further devolution agreement highlighting the significant role that European funds have played in the economic development and growth of GM over the last 20 years. Through devolution, the Combined Authority gained more significant influence and decision-making powers in respect to the €413.8 million 2014–2020 European Regional Development Funds (ERDF) and European Social Fund (ESF) initiatives in GM. More significant influence has enabled GM to integrate and align investments with other aspects of the devolution deal and local economic priorities to improve performance and maximise economic impact (GM-EU Investment Plan, 2016).



Replica of the floor in a cotton mill at the Museum of Science and Industry, Manchester city centre.

3.2 Policy Instruments

A combination of policy instruments has been developed to improve the GM City Region. The instruments have been developed through a combination of top-down approaches, that respond to the needs and challenges of England, and bottom-up approaches from consultations with regional stakeholders in GM. The ERDF and ESF were combined between 2014 and 2020 with the European Agricultural Fund to create the European Structural and Investment Fund (ESIF) for England (GM EU Investment Plan, 2016).

Sustainable Development is an overarching objective of GM's 2014–2020 ESIF plan. It has five thematic priorities: competitive places; science, innovation and the knowledge economy; competitive businesses; low carbon; skills employment and reform. These themes were produced in coherence with the UK Climate Change Act (2008), the Low Carbon Hub and partners. The Integrated GM Assessment conducted as part of the ESIF plan identified seven key areas: climate change adaptation and mitigation; sustainable urban transport; jobs and economic growth through resource efficiency and supporting the low carbon and environmental goods and services sector; transforming the energy system; transforming buildings; the interaction between environment, health and poverty and maximising the value of natural capital. European Union investment in these areas has been central to development in GM and has contributed to sustainable growth and, more recently, to the development of the GM local industrial strategy.

The Local Industrial Strategy, which seeks to develop a plan for jobs, opportunity growth and prosperity in GM, was developed in collaboration between the Greater Manchester public-private multi-actor Local Enterprise Partnership (GMLEP), the (GMCA) and the UK Government with input from businesses, the voluntary and social enterprise sector and citizens. The GM strategy provides a framework for the local industrial strategy, building on previous GM strategies developed in 2009 and 2013 following the Manchester Independent Economic Review (2009). It maintains a focus on living well and ensuring that benefits and opportunities are shared equally among the people of GM (GMS, 2019). Capturing the City Region's pioneering nature, GM devolution is highlighted as an opportunity for developing partnerships regionally, nationally and internationally, allowing for increased control and accountability for the prosperity of the city and its residents (GMS, 2019). The GM local industrial strategy (2019) as illustrated in Figure 3 focuses on place developing prosperous towns and communities across GM by building on current strengths and exploring new opportunities in relation to the grand challenges of health innovation; digital creative and media;

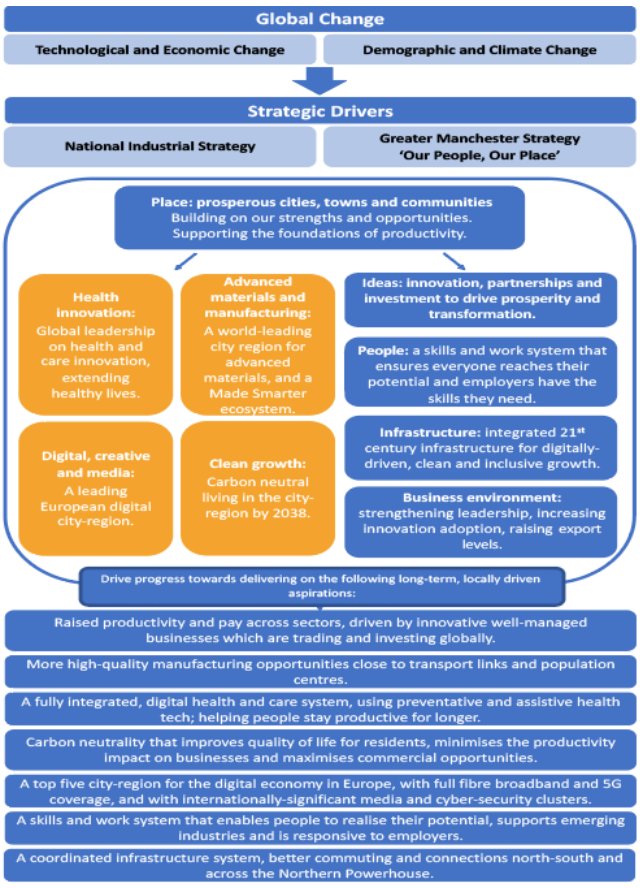


Figure 3. An overview of the Greater Manchester Local Industrial Strategy.

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advanced material and manufacturing and clean growth and supporting the foundations of productivity of people, infrastructure ideas and the business environment (GM LIS, 2019).

These grand challenges are also steered by plans that have been developed locally to shape the City Region for generations to come (GM LIS, 2019). The most relevant of which is the Environment Plan for GM 2018–2024 (GMEP, 2019), which is the central policy instrument steering GM's transition towards the clean growth challenge and its ambition for zero-carbon living by 2038 (GM LIS, 2019).

The environment plan establishes a set of critical targets for GM, aiming for:

- The mitigation of climate change by creating a carbon-neutral economy by 2038, meeting UK carbon budgets and comply with international commitments set out in the Paris Agreement.

- Improved air quality and to meet the World Health Organization guidelines on air quality by 2030 while also supporting the UK government in meeting and maintaining all thresholds for key air pollutants at the soonest possible date.

- Sustainable consumption and production. GM's goal is to become a circular economy, recycling 65% of municipal waste by 2035 and reducing the amount of waste produced.

- Preservation of the natural environment by protecting, maintaining and enhancing the natural environment for the benefit of all by taking steps to implement and achieve environmental net gain.

- Resilience and adaptation to climate change to prepare for the impacts of climate change and adapt to changes caused by climate shocks and stresses (GMEP, 2019).

Within the Environment Plan under Sustainable Consumption and Production, there are four priority areas illustrated in Figure 4.



Figure 4. The priority areas of the Sustainable Consumption and Production challenge in the GM Environment Plan.

The specific sub-targets under the challenge of sustainable consumption and production (SCP) include:

- Producing goods and services more sustainably in the move to a circular economy, with a 38% reduction in industrial emissions by 2025 and a 50–77% reduction by 2038.

- Key focus areas for this target include sustainable product design, resource efficiency and sustainable procurement.

- Becoming more responsible consumers by imposing a limit of 20% on increases in waste currently produced in GM.

- Managing waste as sustainably as possible, achieving a recycling rate of 65% by 2035.

- Reducing unnecessary food waste. While no specific target is provided here, GM is developing an action plan to reduce food waste (GMEP, 2019).

These targets are supported by research by the Tyndall Centre for climate change, which quantified the implications of the Paris Agreement for GM and the shift towards carbon neutrality by 2038 (Kuriakose et al. 2018). However, it is important to acknowledge that targets for responsible consumers are challenging in GM, based on the high population density in the City Region creating higher levels of household waste. Seventeen actions for GM were developed based on this research to deliver this ambition of carbon neutrality. Action 12 on a plastic-free GM, Action 13 on food and Action 14 highlight the need to consult on a resource strategy that sets out what the transition to a circular economy means for GM businesses and consumers (Coyle et al. 2019). The resource strategy is still pending at the time writing and requires the development of the national waste strategy before it can be finalised (Head of SCP GMCA, 2020). The science behind the targets includes a combination of top-down and bottom-up modelling that support actions that aim to improve resource management, including 'decreasing the quantity of waste by 20 percent; increasing the proportion of waste recycled to 65% by 2035 and 80% by 2050; movement from a wasteful linear economy to a circular economy which adds value; reduce waste at source, recycle more waste and use some of our waste as a resource to generate bioenergy' (Coyle et al. 2019:11). Specific targets highlighted by the GM Scatter pathway (Kuriakose et al. 2018) include achieving recycling rate of 65% by 2035. Currently, GM waste disposal in nine out of 10 districts is 47.09%, while in Wigan, which has a separate contract, stands at 48.5%. However, due to the large number of contracts, figures for commercial and industrial waste are currently not available (GMEP, 2019). However, there is a target of 50–77% reduction in industrial emissions (38% by 2025). Currently, data on the efficiency of businesses regarding production and industrial emissions is limited (GMEP, 2019). There is a target to limit of 20% increase of waste currently produced in GM, present, 400 KG of residual waste is produced per person. Other priorities include food waste; here, no official targets are set, although it is estimated that around 10 million tonnes of food waste are produced each year, representing a total value of £20 billion or £700 per household. Here, a holistic approach that considers the entire system is suggested to tackle food waste, with a focus on exploring circular loops that enables those living in poverty to access food that would otherwise go to waste (GMEP, 2019).

In GM, the transition towards a circular economy falls under the banner of SCP, aligning to the twelfth goal of the United Nations' Sustainable Development Goals (SDGs; UN 2015). However, there are clear overlaps with SDG 11 sustainable cities and communities and SDG 13 climate action. At a City Region (GM) level, the title of sustainable consumption and production was decided on for pragmatic reasons as it enables succinct communication and association the different players around the theme of transitioning to a circular economy (Director of Environment GMCA, 2020). As with sustainable development, the circular economy is an overarching theme that spans the aims of the GM Environment Plan and broader priorities of the GM local industrial strategy and Greater Manchester Strategy (Director of Environment GMCA, 2020). This ambition has been supported by stakeholder events, including the GM springboard events, which boosted the drive for clean growth across the City Region and resulted in the formation of the Green City Region Partnership. In addition, a technical report on a mission-orientated approach to clean growth has been provided by Mazzucato et al. (2019); this report supports the 10-year Manchester Independent Economic review (2019) and provides a base of research into the current plans.

3.3 City Region Circular Economy Profile



In March 2018, the GM mayor Andy Burnham hosted the city's first Green summit, collecting opinions from residents and businesses on the City Region's environmental priorities. The event engaged 4000 people through 42 listening events and expert workshops and was the basis for GM's Green City Region report (Muzzucato et al. 2019), and the Green City Region partnership. The green summit report outlines GM's goals to:

- Increase resource and materials efficiency in production processes.

- Design manufacturing and material efficiency in the production process.

- Significantly increase recycling rates and maximise their economic value.

- Reduce the energy and fertiliser footprints of our diets and eliminate edible food waste.

- Source a proportion of biomass energy from waste.

The above goals are supported by the views of residents and organisations, which indicates that the City Region must:

- Establish GM as a zero waste to landfill region by reducing waste and recycling more, reducing single plastic use, ensuring zero exports of waste, increasing local composting and recycling, introducing more efficient recycling programmes and standardising the colours of bins across the city.

- Supporting locally grown food, allotments, urban agriculture, community gardening courses, city farms, vegetable growing, local food outlets and hubs, fruit trees and recognising the wider health and wellbeing benefits of greater activity.

- Purchasing goods (public procurement) with low waste packaging, maintaining high environmental standards and supporting growth in the low carbon and environmental goods/ services sector.

- Encouraging or requiring local businesses and producers to use less packaging, single use plastic and generate less waste; lobbing for higher taxes on waste or penalties on businesses/ organisations that do not comply.

Experts at the event proposed that the City Region should:

- Cut household food waste by 80% by volume

- Introduce public water fountains to reduce the use of disposable plastic bottles

- Better recognise the importance of the green technology sector and the role that energy and material efficiency can play in increasing

productivity and resilience

- Introduce take-back schemes for packaging

- Sign the Milan Food Policy Pact and establish a Greater Manchester Food Board to support the development of a sustainable food ecosystem

- Strengthen GM's productive green spaces and sustainable agriculture enterprises.

- Support businesses in designing 'less in – more out' waste programmes through resource and materials efficiency. Design goods for reuse and recycling and use products for longer.

- Create a GM database of 'waste' materials for reuse and recycling.

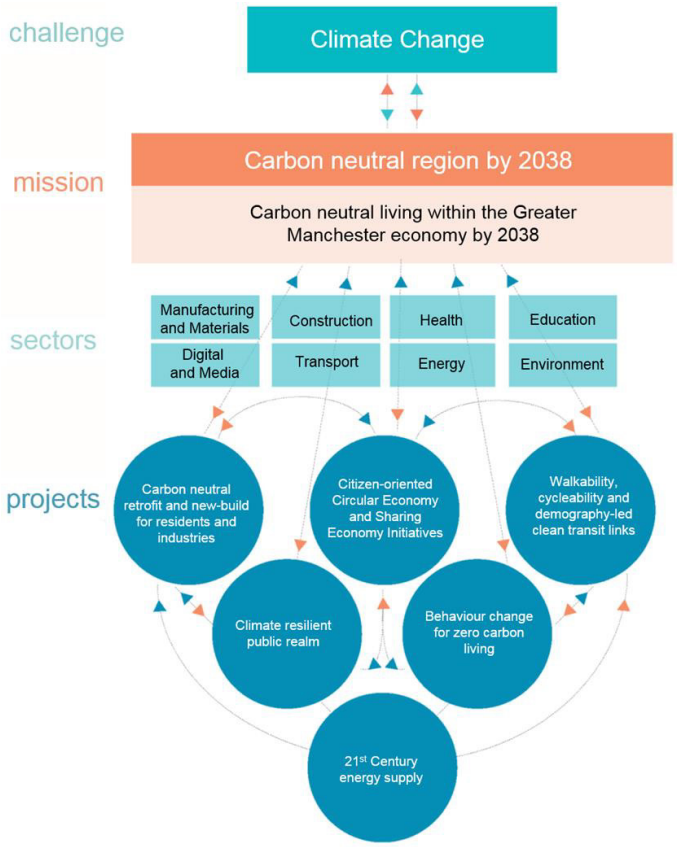


Figure 5. The mission orientated road map for GM.

The insights collected from scientific research, expert, business and resident perspectives have enabled the creation of a roadmap for carbon neutrality in GM utilising a mission-orientated approach at the EU level (Mazzcuato et al. 2019), focusing on the eight core sectors of manufacturing and materials, construction, health, education, digital and media, transport, energy and environment.

A citizen-orientated circular economy and sharing initiatives are a central project in the roadmap, here the mission involves waste exchange as part of the development of resource strategies. It is yet to be decided whether the SCP challenge group should adopt a sector-specific approach or a holistic approach that considers everything as a whole. The preference is for a sector-specific approach, with construction, food, hospitality and tourism identified as areas of opportunity for circular economy business models (Head of SCP GMCA, 2020).

GM's intention is for waste to be seen as a resource through bilateral and multilateral industry linkages and industrial symbiosis (Mazzucato et al. 2019). There is a focus on resource efficiency, recycling and product life extension (Director of Environment GMCA, 2020). New funds and the continued collaboration between Local Government, universities and the private sector is required. An example of such collaboration is the GM Circular Economy Club, which focuses on sharing research, curriculum development and business support (circulareconomyclub.com). The organisation is promoted via a local network of organisers, such as the Waste to Resource Innovation Network at Manchester Metropolitan University, GMCA, Manchester Inward Investment Agency (MIDAS), Greater Manchester Chamber of Commerce and the Business Growth Hub. A more holistic understanding in this area could lead to developments in supply chain transit and logistics. Behavioural change is required

through models of co-production, supported by carbon literacy training in curriculums across GM, as documented in the GM Strategy and GM Environment plan (Mazzucato et al. 2019). The Green City Region partnership is accountable for the actions developed in the Green Summit, the members of which are listed in Appendix 1 and comprise a broad range of stakeholders aligned with the same carbon-neutral vision for GM. At local level, in Oldham for example, the transition towards a green economy is governed through the partnership between the GMCA and Oldham Leadership board, as indicated in the Oldham Plan (2017). More recently, Oldham began to lead in the transition with the development of the Green New Deal (2020), advancing on GM and UK targets and setting out its ambition for the borough to be carbon neutral by 2025 (Hunt, 2020).

Various other activities have been undertaken across the City Region to promote the development of the circular economy. For example, work has commenced with the University of Manchester to develop a sectorial baseline map of circularity in GM. This research will map the resource flows in an out of the City Region across all sectors (Atherton, 2020).

The Manchester Met led TRANSFORM-CE project (Interreg North-West Europe programme) reduces plastic waste that is burnt for energy and creates circular loops of reusing and recycling for plastic of all value, which is used as 3D printing feedstock for developing new products. Forecasts suggest this will divert 55 million tonnes of plastic within 10 years (NWEurope, 2020).

The RE3 initiative addresses the challenge of eliminating plastic waste in a circular economy. As well as reducing plastic waste and subsequently CO2 emissions, the project influences consumers, producers, retailers, Government and regulators, while providing business opportunities for economic development (UKRI, 2020).

The Erasmus + Waste Reduction Initiative focus on encouraging citizens to improve the quality and volume of valuable resources available for recycling. The scheme seeks to change behaviour through a combination of teaching educational resources and ICT with the aim of decoupling material consumption from economic growth (MMU, 2020).

Sha-repair focuses on reducing waste from electrical and electronic goods through the increased use of local repair cafes and workshops using 3D printers to make parts for repair (Therestartproject, 2020).

RESYNTEX focused on integration of the whole value chain from waste collection to recycling to feedstock and uses industrial symbiosis to produce secondary raw materials from textile waste (Resyntex, 2020).

Stitched Up recycles, upcycles, reuses and reduces textiles waste and teaches people skills to incorporate these actions into their daily lives, while also organising educatory and awareness-raising events (Stitched Up, 2020).

Food Chains 4 Europe seeks to develop stakeholder networks, policies and actions to deliver innovation in regional food chains to develop sustainability, increase competition and provide social and economic benefits for citizens through a peer review approach (Intereg Europe, 2020).

Public procurement is exemplified by the Suez waste contract, which has over 50 social value commitments and a contractual agreement to increase household waste recycling and transition towards a circular economy (RecycleforGM, 2020).

Business support provided by the Growth Hub is also available in GM and has resulted in £378.3 million in cost savings, the removal of 1,336,915

tonnes of waste and the creation of 8,314 jobs (Businessgrowthhub, 2020).

Convening events on circular economy have been held by the University of Salford on waste management and the transition to circular economy and future events are planned by the University of Huddersfield specifically honing in on sustainable apparel and textiles (University of Huddersfield, 2020). There are also examples of integrated working between Edge Hill University and Viridor developing the next generation of managers and leaders with the correct skills for the transition to a circular economy (Viridor, 2015).

It is evident from research that there is a strong case for a transition towards a circular economy as part of the wider mission to achieve carbon neutrality by 2038. However, the primary focus of circular economy in GM appears to be ecological, with less emphasis on the social and economic benefits. Developing a sustainable consumption and production is required that brings together the different projects across GM that can be developed at scale and captures the holistic economic, social and environmental benefits of the circular economy business models.



The tram system in Manchester city centre

3.3.1 City Region Circular Economy Drivers, Strengths and Opportunities

The circular economy forms part of the regional strategy based on key strategic drivers for the GM City region. These include the development of place and the enhancement of prosperity of cities, towns and communities. The goal is to raise productivity and pay, while working towards carbon neutrality that improves productivity and maximises commercial opportunities (GMLIS, 2019). As previously highlighted, ecological drivers underlie the ambition to become carbon neutral that address, adapt and build on our resilience to climate change (Coyle et al. 2019). This ambition is also captured under the mission orientated approach to carbon neutrality by 2038 (Mazzucato et al. 2019) supporting the 2015 Paris Agreement (UKCG, 2018). It is also suggested that transitioning now will deliver a range of first mover advantages (GMEP, 2019); however, this is contrasted by some suggesting other regions have already started the transition and positioned their Region to reap any first mover advantages (Battersby, 2020), London being a prime example. There is also a bottom-up agenda in GM that seeks to increase consumer awareness, leading to new consumer demands and consequent changes to procurement processes (Business Development Manager, MIDAS 2020). Consumer pressure is driven by the increasing awareness of sustainability and finite resources issues and has caused business and economists to take notice of the opportunity to innovate and sell to the global market (Director of Environment, GMCA 2020).

Obtaining value from resources is highlighted in the GM strategy. The circular economy should be developed with better design, maintenance, repair, reuse and recycling of goods as a means of emphasising the importance of conserving economically valuable resources (GMS, 2019). The GM spatial framework also stipulates that waste should be treated as a resource and kept in use for as long as possible to reduce the impact of consumption and production (GMSF, 2019). However, it is acknowledged that, due to externalised costs, the full price of our actual cost of products is not paid, which reduces the drive for recycled and reused products (Director of Environment, GMCA 2020). The need to view waste as a resource has been underscored by the recent COVID-19 pandemic, and it is suggested that our reliance on resources will become an increasingly pressing issue in future. The Director of Low Carbon at the GM growth Hub (2020) has highlighted the risk and resilience dimensions, arguing that post-COVID-19, there will be less tolerance to global supply chain risks and single country suppliers. The potential risks emphasise the need to view GM waste as a resource.

It is important to acknowledge the social and economic aspects brought about by the circular economy, including enhanced wellbeing, health and quality of life (UKEP, 2018). The 10-year Manchester Independent Economic review recommends ensuring carbon-neutral living by 2038 to optimise health, the quality of life and the economy (Coyle et al. 2019). Economic development is made possible through the advancement of industry and attractiveness of GM as a region to invest in. This investment subsequently increases jobs and reduces unemployment and reduces the strain on a range of government services. Economic development also leads to fairer wealth distribution, creates relatively low skilled jobs and supports vulnerable people and communities (Director of Low Carbon GM Growth Company, 2020).

At a local level, in Metropolitan Borough local authority areas such as Oldham, there are



Tourism and business in Greater Manchester: Manchester Town Hall

enhanced targets to becoming carbon neutral by 2025 and to becoming one of the greenest boroughs in the country (Hunt, 2020). Social and economic drivers are also evident in Oldham, with the Oldham Plan (2017) highlighting the continuous squeeze on public sector budgets from austerity measures and emphasising the need to develop an inclusive economy in which each resident has an equal chance to succeed and in which communities can thrive. Furthermore, Hunt (2020) highlights the need to cut bills for residents and business and transform the borough to a destination for green tourism and business. Potential is also identified for wealth building using circular models to keep wealth within local areas (Head of External Funding Oldham, 2020) to achieve local social, economic, and environmental wellbeing objectives, by seeking to keep 'the Oldham £ in Oldham'. Local wellbeing and wealth building is also supported by the Leader of Oldham Council (2020), who has encouraged buying local goods and services, employing local people and working in partnership with organisations across Oldham to ensure a living wage (Fielding, 2020). Innovative examples include amazon.com-style platforms for local authority areas that provide digital platforms and delivery services for local businesses in Oldham to residents (Policy and Delivery Manager - Green New Deal, 2020). However, it is important to recognise the importance of Metropolitan Borough local authority areas working together across GM to ensure no areas are left behind during times of crisis.

GM and local authority areas, such as Oldham, have a range of strengths that can support the transition towards a circular economy. One such strength is the City Region's mission-orientated approach to clean growth which has served as the basis for the development of a roadmap for carbon neutrality for the City Region by 2038 (Mazzucato et al. 2019). The five-year environment plan also sets out five principles of working and provides a long-term vision, though it also sets out urgent actions and key priorities that are reported on annually through key performance indicators. This broad environment sets out broad priorities, including actions for residents, local authorities, business and other key organisations, such as the Health and Social Care partnership. In addition, it sets out what is needed from government policy, the current circumstances and the targets that

must be met in the next 5 years.

The design and implementation of the GM vision is supported by the collaborative, inclusive and participatory governance, which is enabled under the devolution agreement for GM and incorporates the co-design and co-production of strategy in GM. The mayoral position was created as part of the devolution agreement in GM and increased GM's control of resources. Devolution and the reform of public services has enhanced the focus on co-operative services across GM, allowing organisations to integrate and innovate to improve outcomes for services (Oldham Plan, 2017). This is supported in areas such as Oldham, (and GM) where there is a real political will at both the City-Region and Metropolitan Borough scales, to come out of the current pandemic crisis by 'Building Back Better' to develop a green economy (Head of External Funding Oldham, 2020). It is through this political will and co-operative services that key governance processes, such as co-design, co-production and systems leadership (Oldham Plan, 2017), can develop solutions for individual local authority areas and the wider GM system. Here, it is necessary to show leadership and share best practices at a national and international level (Head of SCP GMCA, 2020).

The Environment Plan is steered by the Green City Region Partnership and is supported by a range of challenge groups, including the Sustainable Consumption and Production Challenge Group supported by task and finish action group(s) for priority areas (Atherton, 2020). The chair of the SCP group sits on the Green City Partnership Board, which is responsible for the plan and for driving the SCP agenda (Director of Environment GMCA, 2020). Partnerships and convening are also strengths of GM, as emphasised by the Green Summit, which was attended by over 4,000 individuals and sought to develop awareness and create pledges for residents and organisations (Green Summit Report, 2018). Furthermore, the Environment Plan was developed through consultations with stakeholders that lasted over 18 months (Head of SCP, GMCA 2020). The Green City Region Partnership has also engaged with the Good Food Greater Manchester Board, and Sustainable Business Partnership to deliver meaningful change in the City Region, including innovating for resource efficiency (GMEP, 2019). Various campaigns have raised people's awareness, such the plastic-free GM and R4GM recycling campaigns. Capacity building is also evident with carbon literacy training being embedded across organisations in GM (GMEP, 2019), as well as development workshops held by key organisations with ERDF funding, such as the Growth Company; however, it is acknowledged that the majority of this funding is SME-focused, rather than being available to larger organisations (Battersby, 2020).

The culture of collaboration and positive engagement in GM is congruent with the culture of innovation. Emphasised in the GM Local Industrial Strategy, the transition to a green economy requires innovation to reduce costs and increase efficiency and interconnectivity (GMLIS, 2019), building on long-standing links with GM's universities and research and development organisations to continue cross-disciplinary research and innovation (GMLIS, 2019). The 10-year Manchester Independent Review highlights GM's carbon neutral ambition as driving mission-based innovation through a co-ordinated approach (Coyle et al. 2019). 'Innovate Manchester' aims to inspire, enable and continue a culture of meaningful collaboration between large corporates, start-ups, SMEs and academia by shaping innovative propositions for key challenges. Funded by the ERDF, the first event is focused on changing the way we produce and consume in collaboration with MIDAS, the Growth Hub and Future Everything (Business Development Manager, MIDAS, 2020), which feeds directly into the aim of the GM environment plan to promote

SCP. Support for innovative organisations is also provided by the pipeline of graduates of universities in GM that provide a supply of talent for innovation (Battersby, 2020). However, it has been argued that more can be done to support organisations in GM to take advantage of the growing market for low-carbon and environmental goods and services (Director of Environment, GMCA 2020). Innovation is enhanced in GM due to the diverse and broad low-carbon sector (Director of Environment GMCA, 2020). Working together to innovate is particularly important at present as work commences to rebuild the economy post-COVID-19.

It is evident that the strength of GM lies in its ambition and commitment to develop world-class assets and create high-quality manufacturing sites that are well-connected and digitally optimised with the latest 5G technology (GMLIS, 2019). Waste collection and disposal systems are also being developed and enhanced; examples of this include the £1 billion contract with Suez, which incorporates 50 social value commitments and emphasises the transition to a circular economy. The Suez contract is just one example of public sector procurement stimulating resource efficiency. As highlighted in the GM strategy (2018), low-carbon practices must be embedded in public sector procurement. An example of this includes pilot projects to adopt a 10% zero-carbon weighting in all procurement and contract management (GMEP, 2019). Furthermore, carbon calculators that enable financial management decisions in procurement and that consider lifetime costs and carbon implications are being developed (GMEP, 2019). In addition, there are plans to embed environmental and social criteria into procurement and ensure that procurement staff are trained in carbon literacy (GMEP, 2019). Responsible procurement is also evident in Oldham, with the Green New Deal emphasising a comprehensive green approach across all current and future activities (Hunt, 2020).

A key opportunity involves the development of a resource strategy and SCP plan with appropriate funding. The SCP plan is currently being developed by the Head of SCP, and the resource strategy is pending the development of the National Waste Strategy as it is a statutory document. The resource strategy also requires environmental assessment and stakeholder engagement (Head of SCP, GMCA 2020). As exemplified by the London Waste and Resource Board, a fully funded resource and circular economy programme until 2025 will enable progress in the transition. Funding will need to come from investment from national Government because of continued budget cuts that have created a resource-constrained environment that will be worsened with the removal of EU funding post 2020 following Brexit. On a national level, the UK government have set out their intentions to become a global standard setter in finance for clean growth. This includes the development of an industrial strategy challenge fund that will build on £2.5 billion government investment in low carbon innovation set out in the Clean Growth Strategy (2018), which is supported by a green finance task force that provides recommendations on development in the public and private financing of clean growth (UKIS, 2018).

As regulation and legislation is currently absent at the GM level, another opportunity involves the introduction of regulation and legislation to create a level playing field. At the national level, this is emphasised by in the Industrial Strategy that makes a commitment to use all the government tools available to support innovation, including market design, taxation and regulation. The Clean Growth Strategy outlines the potential introduction of extended producer responsibility (EPR) schemes (UKCGS, 2018). Further detail is provided in the 25-year UK Environment Plan (2018), including:

- At the production stage, producers will be encouraged to take more responsibility for

the environmental impacts of their products and rationalise the number of different types of plastic in use by working with industry to rationalise packaging formats and materials formats to ensure that more plastics can be easily recycled and that the quality of collected recycled plastics is improved.

- EPR systems (including packaging waste regulations) will be reformed to incentivise producers to take greater responsibility for the environmental impacts of their products. This includes exploring EPR requirements to plastic products not currently covered by existing regimes to create a better market for recycled plastic.

- The highly successful 5p plastic bag charge will be extended to small retailers, and the need for compulsory options if voluntary agreements prove ineffective will be explored. Continuing support will be provided to the industry-led on-pack recycling labelling system, and all brands and retailers will be encouraged to use this system to provide information.

- New regulations to improve local authorities' enforcement powers will be introduced, supported by new guidance on proportionate use. At a City Region level, decisions are pending national decisions on EPR regulations, deposit return schemes and taxation on plastics.

- Furthermore, zoning systems for commercial and industrial waste will be developed to reduce the large number of contracts, promote better management and reduce transport in and out of the city, contributing to the clean air policy (Head of SCP GMCA, 2020).

Another opportunity identified in GM relates to food and garden waste, which currently stands at around 200,000 tonnes per year. There are opportunities for large-scale projects in GM around anaerobic digestion, which could incorporate municipal and commercial waste for the GM conurbation. However, feasibility studies are required due to issues around digestate and the need for innovative technology (Head of SCP GMCA, 2020).

A key opportunity is the development, investment and sharing of project best practices. Projects such as Oldham's Northern Roots initiative serve as proof of concept that deprived areas can re-brand and transform themselves into sustainable green spaces that focus on community assets and look for ways to protect, enhance and leverage their value beyond short-term economic assessments. The Northern Roots project aims to take a 'holistic' approach, combining social wellbeing and healthy-lives, initiatives, such as the NHS workforce using social prescribing of physical activity in green spaces, with environmental, economic and physical infrastructure enhancement outcomes, such as sustainable drainage systems, buildings with green roofs, green walls, biodiversity offsetting and renewable energy. While providing businesses with locations to start-up and diversify with circular economy business models and provide a series of income streams to the 160-acre site-based Northern Roots project (such as income from subsidised small-business rentals, green-space opportunities for offenders, training, skills and ultimately employment opportunities etc) (northern-roots.uk, 2020).

The Northern Roots location between the wards of Alexandra and Medlock Vale also provide opportunities for community building between diverse ethnicities (Policy and Delivery Manager - Green New Deal, 2020). Such projects could be a starting point for developing wider networks and initiating similar transformation in surrounding regions. This emphasises the need to share best practices as a means of understanding what is currently being done and what can be scaled up across the City Region (GMEP, 2019). The potential of eco-parks, such as Northern Roots in Oldham,

provide potential pilots that could present scalable investment opportunities that create social, economic and environmental circular economy flows. Specific requirements have been put in place to produce checklists for development to support similar projects in the future (Policy and Delivery Manager - Green New Deal, 2020).

The Policy and Delivery Manager for the Green New Deal in Oldham (2020) has also highlighted potential opportunities to encourage existing businesses to diversify by providing examples of business case studies from the REDUCES project, further emphasising the need for additional resources to support organisations in the transition towards a circular economy in GM.



CGi image of the adventure park at Northern Roots, Oldham. (Image credit: Northern Roots)

3.3.2 City Region Circular Economy Barriers, Weaknesses and Threats

Terminology, understandings of the circular economy, and business models relating to what circular economy looks like in practice, presents barriers to development CE in GM and were brought to the fore as a potential barrier to the pragmatic development of circular economy in multi-ethnic Metropolitan Borough local authority areas, such as Oldham. A challenge is how to develop an understanding that aids the pragmatic local translation of circular economy, so that it can be easily presented as an opportunity for local businesses and social enterprises. It was felt there is a risk that the concept of circular economy might be viewed as abstract and overly academic, hence a 'turn-off' for local stakeholders including local politicians. Efforts to overcome this potential barrier need greater attention, perhaps based on a limited number of overarching principles, supported by examples in-practice (Policy and Delivery Manager - Green New Deal, 2020).

The Ellen MacArthur Foundation (EMF) provides a pragmatic discussion on what circular economy is and is one of the most cited go-to references for non-academic practitioners and stakeholders (Ellen MacArthur Foundation, 2020). However, the fact that the EMF website text itself keeps changing, and that other circular economy websites contain different and differently focused definitions, illustrates that the concept is not stabilised in definitional terms, but rather, is adapted locally to address specific local situations and local policy contexts. For example, whilst all descriptions emphasise a shift from linear (end of pipe approaches to dealing with waste and pollution) to circular economy (including designing-out waste) including shifting business models from selling products to selling products 'as services' therefore keeping products in commercial circulation and use for longer; with a primary focus on environmental improvements through dematerialisation (Reduction; Re-use;



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Recycle; Re-manufacture and Re-design of material artefacts and production/consumption) in order to improve and design-out all forms of natural resource use, including energy, emissions and water.

However, by contrast, the African Circular Economy Network (ACEN) for example, centres its vision in addition on social and economic regenerative/ resilience objectives, inclusivity and social justice i.e. going beyond the usual environmental and economic emphasis to simultaneously incorporate social, environmental, and economic dimensions of (sustainable) circular economy.

"The vision of the African Circular Economy Network (ACEN) is to build a restorative African economy that generates well-being and prosperity inclusive of all its people through new forms of economic production and consumption which maintain and regenerate its environmental resources" (ACEN, 2020).

So, whilst EMF is one of the most widely cited definitions, it lacks the social dimension that is a key focus in GM and Oldham. An analogy such as the cherry tree analogy could prove useful here, as waste from the cherry tree provides nutrients that feed the environment. These circular and self-sustaining flows can be easily pictured as economic, social or environmental flows and should be comprehensible across sectors due to the simplicity of the analogy that derives from biomimicry and the imitation of natural cycles.

Circular economy business models provide a suitable way of breaking the circular economy down into components relevant to different sectors and industries; however, the academic nature of these business models and the need to simplify them to gain traction with business and policymakers in GM have been identified as potential barriers. The components of each business model must be broken down to enable buy-in (Director of Low Carbon GM Growth Company, 2020). Currently, a high level of ambiguity surrounds the business models, put forward by Sitra (2019), and areas of overlap are evident between the business models, as well as areas in which the models do not fit with circular economy examples in GM (Head of External Funding Oldham, 2020), which creates complexity. This complexity leads to a lack of traction, difficulty in understanding and less buy-in or lower priority compared with simpler low carbon options that gain buy-in instantly based on their economic benefits. Furthermore, as definitions and examples are not provided in the current status quo report, placing businesses within each model is difficult to do with certainty. More practical detail is required to translate the business models into everyday use and reduce complexity to communicate these models effectively to policy makers and the business community (Director of Environment GMCA, 2020). The key challenge for partners is to develop simple and relatable explanations of business models using practical case study examples of best practice from across each partner region. Further support could comprise a central resource for organisations to access that provides supporting material for capacity development (Policy and Delivery Manager - Green New Deal, 2020). However, different translations may be required for policymakers to understand the wider benefits of the circular economy and gain buy-in, whereas communication for business may be about costs and financial reward (Director of Environment, GMCA 2020).

Another potential barrier to the development of circular economy in GM involves the allocated funding to circular economy-focused projects. The European Regional Development Fund and ESIF programme is scheduled to end in 2023, with no new allocations from the current 2014-20 programme after December 2020 and there is uncertainty in the UK about funding post-Brexit. The Local Industrial Strategy for GM does not

allocate any new spending commitments for the grand challenges; instead, it proposes the strategic use of local funding streams and the maximisation of the impact of the Shared Prosperity Fund (GMLIS, 2018). The Shared Prosperity Fund replaces EU ESIF funding post-Brexit. Although this fund is intended to be similar to previous themes in EU Structural and Investment Funds, the priorities are yet to be developed and will be based on domestic priorities with a focus on investing in people (Parliament, 2020). However, without circular economy-specific commitments, other domestic or low-carbon initiatives may take priority (Director of Low Carbon GM Growth Company, 2020).

Numerous funds are acknowledged to have potentially contributed to the transition, including £60 Million investment into sustainable plastics drive to net zero (BEIS, 2019). In addition, a £561 million Innovate UK fund (BEIS, 2017) recently launched funds specifically related to circular economy, including up to £5 million for catalysing green innovation in supply chains and £800,000 for designing sustainable plastic solutions. Further examples are the recently created £40 million Clean Growth Fund, £20 million government investment and £20 million charity investment. With further private sector investment, this could reach £100 million by autumn 2021 (BEIS, 2020). Increased funding is required by organisations due to start-up costs and/or transition costs arising from required system improvements (Business Development Manager, MIDAS 2020), which create barriers to engaging in the transition towards a circular economy. Importantly, investment will be required by the UK government if the goal to drive innovation in this space (Head of SCP GMCA, 2020). Furthermore, limitations of previous European funding programmes that have created barriers in the past, for example in terms of the eligibility of certain kinds of activity, serve as opportunities to learn when creating of new funds. This includes the narrowness of ERDF funding and its lack of practicality for businesses, and in some cases, its inappropriate measurement variables and high levels of bureaucracy (Director of Low Carbon GM Growth Company, 2020). Current EU funding in GM is supported by the waste levy and GM precept; however, external funding from the Government will be required to realise the ambition in GM (Head of SCP GMCA, 2020). An environment fund has been proposed in GM to provide a clear, consistent and transparent mechanism to provide a blend of finance that supports the mayor's goal of developing a Green City Region. Here, the focus is on the natural environment, though it could be expanded to include resource efficiency and non-statutory waste reduction initiatives (Atherton, 2019), however progress has not been confirmed. Given that the proposed Shared Prosperity Fund may be limited following the COVID-19 pandemic, it is necessary to explore how circular funds can be generated to support the GM economy (Director of Environment, GMCA 2020)

GM lacks the power to control all its budget and create regulations and incentives for organisations in GM. The Greater Manchester Environment Plan (2019) highlights that further powers and incentives are needed to increase reuse and recycling for residents and businesses. However, national legislation can result in immediate economic changes to the entire system (Director of Environment GMCA, 2020), control the budget and create incentives for organisations. Furthermore, current household municipal waste only collects plastic bottles, while the rest of the plastic in GM is burnt for energy. This may in part be due to long-standing waste-to-energy contracts set up with Viridor Laing in 2009 that require waste to have a high calorific value (Director of Low Carbon GM Growth Company, 2020). It is evident that, despite devolution agreements, more power and control is needed in GM; however, they must be used to create the right contracts, regulations and incentives.

A further barrier involves a lack of consumer incentive to engage in circular business models due to the low cost of new products using virgin material, where costs have been externalised and don't account for environmental and social impacts. The challenge for consumers is worsened by the lack of labelling for products and services that should highlight the true cost and environment and social impact, making responsible decisions more difficult to make. The lack of information on actual cost and poor labelling reduce market opportunities for responsible products. Furthermore, there is little incentive at the end of life to return goods to producers as the benefits are gained by the producer, as opposed to the purchaser of the product. These actions could be resolved by national legislation, but it would be difficult to implement such policies at the City Region level (Director of Environment, GMCA 2020).

There are also evident weaknesses in GM, such as a lack of skills to support the transition towards a circular economy. In addition, there are a lack of focused training opportunities and courses provided by colleges and universities. The GM Environment Plan acknowledges that further upskilling will be required to fulfil the substantial skills shortage in the new green economy sectors (GMEP, 2019). Audits will be required to gain a clearer picture of the further and higher education courses currently on offer (Head of External Funding Oldham, 2020) to identify whether new courses/apprenticeships or additional resources are needed. Examples of one such resource is the Waste to Resource Innovation Network at Manchester Metropolitan University designed for schools and universities (W2RIN, 2020), which could be adapted for college courses. There is also a lack of capacity (knowledge, skills, but also social and economic capital, and identify and develop demand and customer bases through network-building and business opportunity-matching) for organisations in GM to fulfil the requirements of a circular economy (Policy and Delivery Manager - Green New Deal, 2020). This lack of capacity is an ongoing issue, particularly for SMEs, and highlights the need for appropriate training to develop and support for managers and business owners to create environmental champions with the correct skills and to embed sustainability into their core business, as opposed to viewing it as additional extra. Further to this, training must have simple messages that are easily translatable into practical actions. Here, the action-planning element of carbon literacy training available to organisations, as highlighted in the GM Environment Plan (2019), could be adapted for this purpose.

The lack of useable data available to organisations in GM to make decisions and track and monitor progress on industrial and commercial waste is a weakness for GM (Director of Low Carbon GM Growth Company, 2020). However, the GM REDUCES business 'Product as Service' case study Waste Logics, an award-winning Bolton-based design-focussed local systems/software company which provides solutions for national and international clients to manage, move, track and trace material flows transparently, with additional services to help clients identify further business opportunities through data analytics.

The limited data on the production of industrial emissions is also acknowledged in the GM Environment Plan, which highlights the requirement for relevant metrics. However, a key challenge in this area is the wide range of private contracts, which makes it difficult to create an overarching collection and measurement tool. This highlights the need for the standardisation of waste collection across the City Region (Director of Low Carbon GM Growth Company, 2020). Some developments in this area have progressed through the collaboration between the Green City Region and the Sustainable Business Partnership (GMEP, 2019). However, it is crucial that all data available, whether on waste, emissions or

customer relationship data, is user friendly and accessible to policy makers and organisations (Policy and Delivery Manager - Green New Deal, 2020).

One current challenge for GM involves getting the mix of stakeholders involved in the sustainable consumption and production challenge group. The group is mainly comprised of policy makers, academics and consultants, though it requires integration with organisations with experience from across the system, such as waste contractors. Exploration of the holistic import and export of resource flows across GM is needed to identify all the key stakeholders required (Director of Environment GMCA, 2020), currently being explored as a PhD research project. The main gap is in commercial space; however, the capacity for the GMCA to engage with the commercial sector is limited. One challenge when bringing in organisations from the commercial sector is their competitive nature and, in some cases, their lack of willingness to share IP, which could otherwise enable greater consistency (Head of SCP GMCA, 2020). However, multinationals, such as Coca Cola, signing up to the Ellen MacArthur foundation and promoting the need for cross-sector collaboration with governments and other stakeholders should lead to an increased will to work together to resolve challenges. In future, it will be important for manufacturers to communicate with stakeholders, such as waste disposal contractors, in the design phase (Head of SCP GMCA, 2020)

There are also capacity challenges for GM to deliver UK policy to increase the number of bins to enable the improved separation of waste in GM due to the costs associated with managing waste disposal and collection, increased health and safety requirements and feasibility for residents. Ensuring that the economics stack up when the operation is rolled out at scale across GM and over the long term is necessary, which is made challenging if organisations innovate to reduce the amount of certain types of waste to avoid taxes and regulation (Head of SCP, GMCA 2020).

There are also threats to the transition towards a circular economy in GM, including the uncertain financial situation for the UK due to Brexit and the COVID-19 pandemic. The threat of uncertainty may lead to a lack of funding for organisations and could reduce council services. The Policy and Delivery Manager for the Green New Deal in Oldham (2020) has argued that environment and sustainability teams are often the first to be cut. In addition, making the circular economy a priority in GM and Oldham above other domestic priorities (Head of External Funding, 2020) or low carbon priorities (Director of Low Carbon GM Growth Hub, 2020; Director of Environment GMCA, 2020) will be a challenge.

3.3.3 Vision of the Development of the Circular Economy in the GM City Region

The vision for circular economy in GM must be clearly set out in the upcoming plan for sustainable consumption and production, and the REDUCES Action Plan, with detail provided on whether to adopt a sector-specific or holistic approach to circular economy development. The current preference is towards a sector-specific approach with priority sectors, including construction, food and hospitality and tourism. Improvements in these areas will be supported by the production of the sectorial baseline map of circularity in GM. The sectorial baseline map should also provide information on the spatial geography of the networks required for a circular economy in GM and whether the networks for circular economy business models should operate at a local (Oldham) or City Region (GM) level, or whether they should be integrated with other regions nationally and internationally. Understanding the correct spatial geography for each business model is critical to future development (Director of Low Carbon GM Growth Company, 2020).

The circular economy in GM is focused on reducing waste through resource efficiency and recycling. Developments in this area have been made through public procurement, such as Suez's household municipal waste contract that incorporates 50 social value commitments. Though this is clearly a waste-management and reduction model rather than a CE model as described above. Nevertheless, challenges in this area include a high proportion of waste that is diverted from landfill to be burnt for energy. GM seeks to address this issue and work towards the reduction, reuse and recycling of all waste. This ambition is evident in the production of commercial and industrial zoning tenders to reduce the number of contracts, which create challenges for logistics and data collection (Head of SCP, GMCA).

Innovation in GM is at the heart of circular economy business models and builds on a long-standing history of collaboration across the City Region between local Government, business, voluntary sector, social enterprise and research institutions on projects on plastics, textiles, food, electronics and business support services. These



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innovative collaborations are supported by a flow of university graduates who supply the skill and capacity gaps that are emerging in the City Region. Post-COVID-19, there will be a need to rebuild the GM economy, with circular economy business models presenting an opportunity to develop a more resilient and self-sustaining economy that builds prosperity for citizens. To continue to promote the culture of innovation, integrating relevant stakeholders across GM is essential. This can be achieved by developing a sectorial baseline map for circularity that identifies resources flows in each sector.

Despite the strong emphasis on waste at a City Region level and at the local level in areas such as Oldham, there is a much broader emphasis on the social and economic aspects of the circular economy, particularly in terms of wealth building. Innovative projects, such as Amazon-style platforms for local businesses and residents, create innovative solutions that enable circular models to be used by local business and residents to become self-sufficient and competitive against larger retailers that extract the Oldham pound out of the economy, while also offering environmental benefits due to improved logistics and smaller supply chains (Policy and Delivery Manager Oldham, 2020). Innovative eco-parks also offer potential, such as Northern Roots, to develop communities, providing amenity, recreation, health and enhancing wellbeing, biodiversity and ecosystem service value. These areas also provide locations for existing business to diversify and new business incorporating circular business models to be created. The development of Northern Roots includes a consultancy checklist to enable the project to be piloted and scaled up across other parts of GM. Northern Roots has the potential to balance the creation of jobs, skills and business opportunities for local people with the preservation and enhancement of biodiversity and the environmental value of the site.



The 160-acre green space of the Northern Roots site. The site includes flat grass land, heath, wetlands and woodland. (Image credit: Northern Roots)

4 Regional Conclusion

The status quo report has been developed by consulting existing reports, policy, strategy, interviews and focus groups with key stakeholders and plans for the development of clean growth in GM towards the ambition of carbon neutrality by 2038. In GM, there is a suite of EU and UK policy instruments, including European Structural Investment Funds, local industrial strategies and environmental plans steering the City Region and local activity towards sustainable development objectives.

There is a range of separate circular economy business activities and research projects covering plastics, textiles, food and electronics in the GM City Region; however, developing a plan for sustainable consumption and production that brings together current activity and steers the City Region during uncertain times. The development of a sectorial baseline map for circularity in GM will enable the identification of relevant stakeholders and priority areas for the development of circular economy business models in the GM City Region. In addition, focused investigations into priority sectors in GM are required to enable the exploration of circular economy business models and promote the development of business cases for the City Region to highlight potential areas for development and full life cycle assessment of proposed initiatives.

The strengths of the City Region include an overarching vision and roadmap towards the 2038 carbon-neutral ambition, which is supported by collaborative governance processes, experience in partnering and convening and a culture of innovation and industrial symbioses. This is further supported by public procurement practices that embed social value commitments into public sector contracts as a commitment to developing world-class assets in the City Region. In addition, innovative eco-parks are being built on available assets in local authority areas that are inclusive of integrated services from environment, health and social care. Development in the City Region could be further supported by increased powers for local Government and through the introduction of legislation and regulation in the City Region, which currently represents a gap in the policy toolkit for GM.

Areas for development in the City Region include the improved translation of the concept of the circular economy and components of individual business models to improve awareness and gain buy-in from policy makers and businesses. There are also clear skill and capacity gaps in the City Region that must be addressed by mapping relevant courses and including training incorporating behaviour changes initiatives, such as the carbon literacy programme. Embedding circular economy initiatives in the City Region has the potential to develop a more resilient conurbation and reduce the risks associated with global supply chains and single country suppliers, while also supporting zero waste and carbon agendas. However, certainty around funding post-Brexit and the COVID-19 pandemic is critical, particularly regarding specific funding for circular economy models compared with other domestic and low-carbon priority areas.

Current measures in GM are focused on ecological factors and centre mainly on resource efficiency and recycling. Progress is currently hampered by a lack of data on commercial and industrial waste, which prevents the collection of accurate measurements. Further developments are required to enable accurate reporting across the conurbation and to capture the social and economic benefits of the circular economy, particularly for local wealth building, which is a priority for local authority areas that suffer from above-average levels of deprivation, such as Oldham. Wealth

building is facilitated through innovative solutions, such shared platforms for local businesses and residents, that can create self-sustaining circular economic flows across the City Region, increase opportunities for local business, reduce reliance on funding and prevent wealth from being extracted from the local economy by multinational organisations. Positive environmental benefits are also made possible through smaller supply chains and logistics. Innovative initiatives piloted in local areas could be scaled up across the City Region for the benefit of the entire conurbation, extending the collaborative culture of GM.

5 References And Additional Material

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Appendix 1: Membership of the Green City Region Partnership for 2019/20

Councillor Andrew Western (Trafford) Portfolio Holder & Chair

Eamonn Boylan GMCA Chief Executive

Councillor Angeliki Stogia Transport Committee Representative

Councillor Alan Quinn Waste & Recycling Committee Representative

Councillor Antrobus Planning and Housing Committee

Chris Oglesby Local Enterprise Partnership (LEP) Representative

Roger Milburn Strategic Infrastructure Board

Anne Selby (Wildlife Trust)/ Chris Matthews (UU) Natural Capital Challenge (Local Nature Partnership Representative)

Robin Lawler (Northwards Housing)/ Professor Will Swan (Salford) Low Carbon Buildings Challenge

Peter Emery & Paul Bircham (ENWL)/ Stuart Easterbrook (Cadent)Energy Innovation Challenge and Private Sector Representatives

Richard Jenkins (Suez) Amanda Reid (Manchester Metro University) Sustainable Consumption and Production Challenge

Louise Blythe (BBC)/Phil Korbel (Cooler Projects) Communications & Engagement Challenge

Professor Carly McLachlan (University of Manchester) 5 Year Environment Plan Forum

Lee Rawlinson (EA) Environment Agency Representative

GM Universities Representatives

Hisham Elkadi (University of Salford)

Nalin Thakker (University of Manchester)

Andy Gibson (Manchester Metropolitan University)

Bernard Magee (Siemens)/Angela Needle (Cadent) Private Sector Representatives

Patrick Allcorn (Department for Business, Energy and Industrial Strategy) Central Government Representatives

Kristina Poole (Public Health England) Public Health Representatives

Carl Moore (Homes England)

Sarah Price (Health and Social Care Partnership)

Simon Nokes (Greater Manchester Combined Authority)

Mark Atherton (Greater Manchester Combined Authority)

Simon Warburton (Transport for Greater Manchester)

Megan Black (Transport for Greater Manchester)

Darryl Quantz (Health and Social Care Partnership)

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