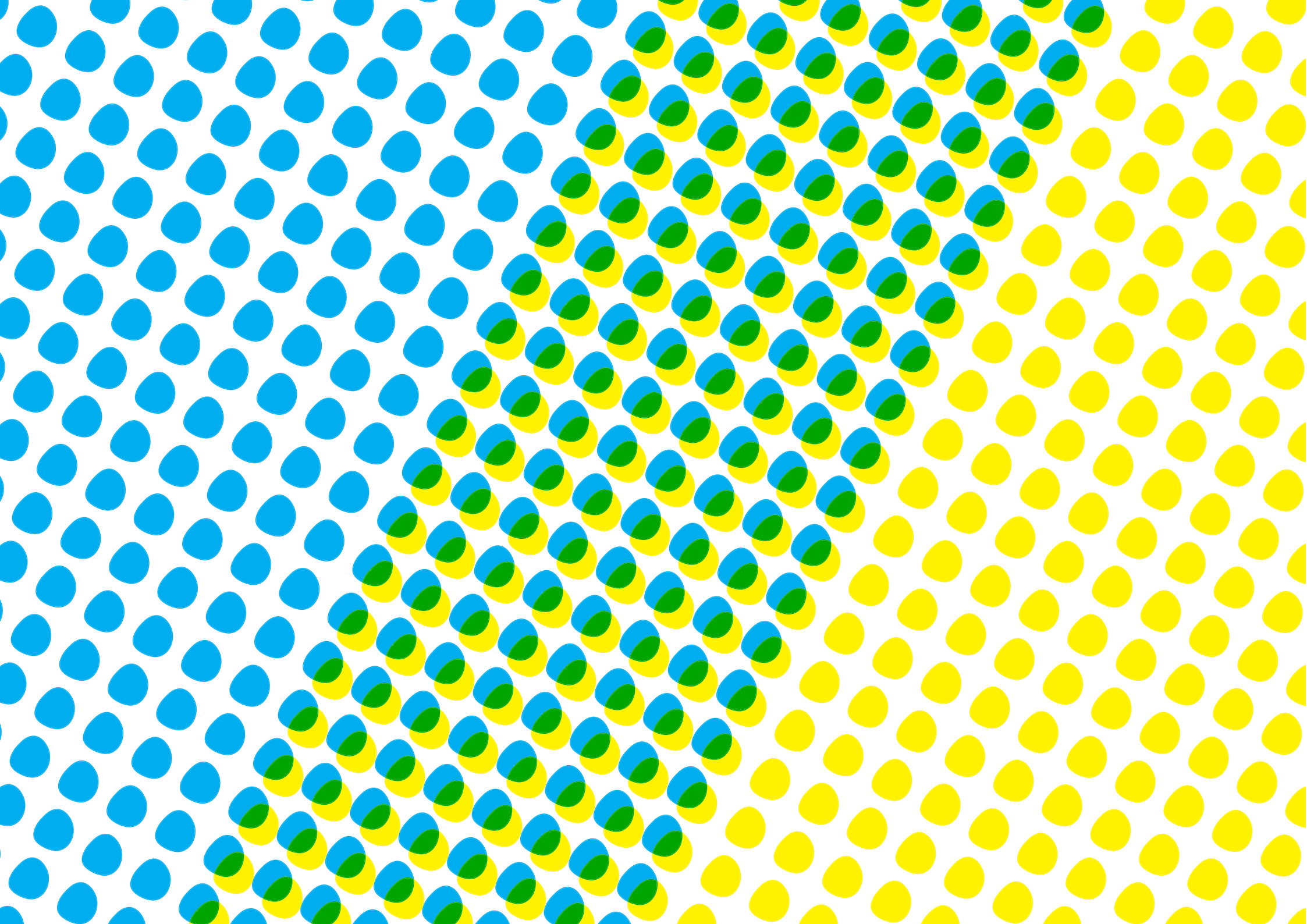
Strategic Assessment Review / Strategic Outline Case for Connected Circular Economy Hubs

Comhairle Cathrach Bhaile Átha Cliath
Dublin City Council

Belfast City Council

M-CO



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EXECUTIVE SUMMARY

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Belfast City Council and Dublin City Council were awarded funding under the Shared Island Fund to undertake a Strategic Assessment Report/ Strategic Outline Case (SAR/SOC) into the development of Connected Circular Economy Hubs in Belfast and Dublin.

This SAR/SOC report has been informed by the policy context in Ireland and Northern Ireland, extensive review of international practice in relation to circular economy hubs and regions, workshops with key circular economy stakeholders in Belfast and Dublin, an Expert Advisory Group and the Connected Circular Economy Steering Committee from Belfast City Council and Dublin City Council.

A clear case for change has been identified. To reach Net Zero, a fundamental shift is needed in the way we produce and consume products, buildings, food, and services, which together account for approximately 45% of greenhouse gas emissions globally.

From an economic perspective, recent international crises (e.g., Brexit; conflict in Ukraine) have demonstrated supply chain vulnerabilities and the impacts on trade for Ireland and Northern Ireland. Climate change is likely to exacerbate these vulnerabilities. Strategic intervention in key sectors can accelerate the transformation to a circular economy, which will ameliorate these structural challenges by reducing dependency on imported raw materials and strengthening internal supply chains for secondary raw materials.

Cities have a pivotal role in the transition to the circular economy. Belfast and Dublin are economic drivers in their respective economies with concentrated levels of demand, flows of trade and waste, enterprise and innovation resources.

Both Dublin and Belfast City Councils have significant spending power that can be aligned with circular economy models. The transition to a circular economy is critical if Belfast and Dublin are to remain resilient to external shocks, sustain their standing as centres of innovation, and continue to be attractive to inward investment where environmental, social and governance (ESG) factors are a growing influence in investment decision-making.

Policy and regulatory drivers are aligning to drive the transition to a circular economy and this transition will create new economic opportunities. Yet available research indicates an absence of awareness or readiness among businesses, particularly Small and Medium Sized Enterprises (SMEs) and micro-enterprises, in relation to the challenges and opportunities the circular economy will bring.

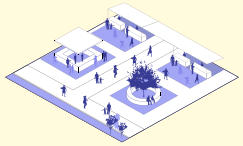
Targeted intervention is required, primarily to deliver for businesses, their investors, and their clients, but also to increase the circularity of primary and secondary raw materials, reduce waste and contribute to achieving Net Zero by 2050.

The development of Connected Circular Economy Hubs is the catalyst that can drive the transition of Belfast and Dublin to a circular economy at the pace and scale required. There are unique opportunities arising from a Connected Circular Economy between Belfast and Dublin, that can underpin innovation, complementarity in approaches, and economies of scale for key productive sectors in both jurisdictions.

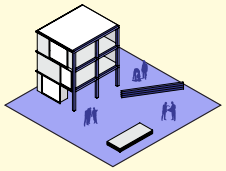
The process of developing this SAR/SOC explored a diverse longlist of 9 options, from 'do nothing' and 'do minimum' options to online platforms and social innovation models, to sector-specific and sector-agnostic hubs. Multi-Criteria Analysis identified four options as Emerging Preferred Options for Belfast and Dublin.

Each of these four options will see employment of a dedicated team to deliver programmes that support businesses.

With the exception of the 'do minimum' option, these options also involve the development of new facilities to support circular economy businesses.



RegenPorts – This option will develop Connected Circular Economy Hub facilities at Belfast Harbour and Dublin Port. RegenPorts focuses on increasing the circularity of the significant flows of waste and materials transitioning through the ports. These hubs will provide spaces for collaboration and circular innovation bringing together existing companies trading through the ports as well as port-based companies, start-ups, scale-ups, universities and other research and innovation partners. RegenPorts could also be developed with a sectoral focus, for example in the areas of food or construction.



HomeLab – Through the development of hub facilities in Belfast and Dublin, HomeLab will focus on increasing circularity in the built environment, with an initial focus on public sector construction projects. Construction produces the largest volumes of waste in Ireland and Northern Ireland, and demand for construction products and services will continue to grow in line with demographic drivers in the coming decades. HomeLab hubs will provide spaces for collaboration, circular innovation and demonstration. HomeLab also proposes material banks and circular depots that provide for disaggregation, processing and storage of construction materials for re-use.

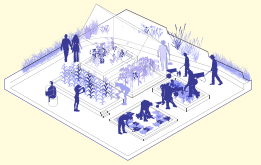
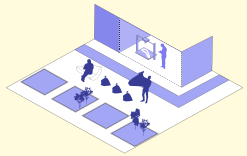


Plate – Circular food enterprise hubs will be developed in Belfast and Dublin. Food and hospitality are key sectors in Ireland and Northern Ireland, and the transition to more sustainable models of food production and consumption will be vital to the continuing vitality of these sectors. Plate will provide commercial kitchens and lab spaces for rent to start-ups and food businesses, to facilitate prototyping and new product development. Plate will also offer specialised incubator and demonstrator programmes, linking into the existing food and hospitality ecosystems in both cities.



Connect – Connect establishes a strategic Connected Circular Economy Hub initiative between Belfast City Council and Dublin City Council, with staff in both cities. Connect recognises the need to harness circular policy initiatives and coordinate fragmented resources in both cities in targeting enterprise engagement to accelerate the transformation to a circular economy at the pace and scale required. Connect is the 'Do Minimum' option. It requires the provision of office and meeting space but, unlike the other Emerging Preferred Options, it does not require capital development at the outset. Through Connect, a pathway could also be developed towards medium-term delivery of capital projects that tackle higher impact sectors.

These Emerging Preferred Options have transformative potential for both Belfast and Dublin. The resulting Connected Circular Economy Hubs will:

- Support the establishment of new circular economy enterprises in Belfast, Dublin, and along the Dublin-Belfast Economic Corridor
- Support existing businesses in their transition to a circular economy
- Increase circular material use rate along the Dublin-Belfast Economic Corridor
- Identify circular economy barriers at city-region level so that Belfast and Dublin can achieve strategic aims for the circular economy, material flows, productivity, inclusive growth and innovation.
- Contribute to Ireland and Northern Ireland achieving Net Zero emissions by 2050.

The SAR/SOC is supported by high-level cost estimates, an appraisal plan and an outline governance plan that takes account of the Emerging Preferred Options.

If the appropriate capital funding opportunity can be identified for Connected Circular Economy Hubs, the Emerging Preferred Options are intended to facilitate a more targeted approach to economic appraisal in the full and final business case.

HomeLab offers distinct advantages in that public sector procurement and investment frameworks for housing and construction will demand transition to circular economy models, and supports are required to accelerate this transition.

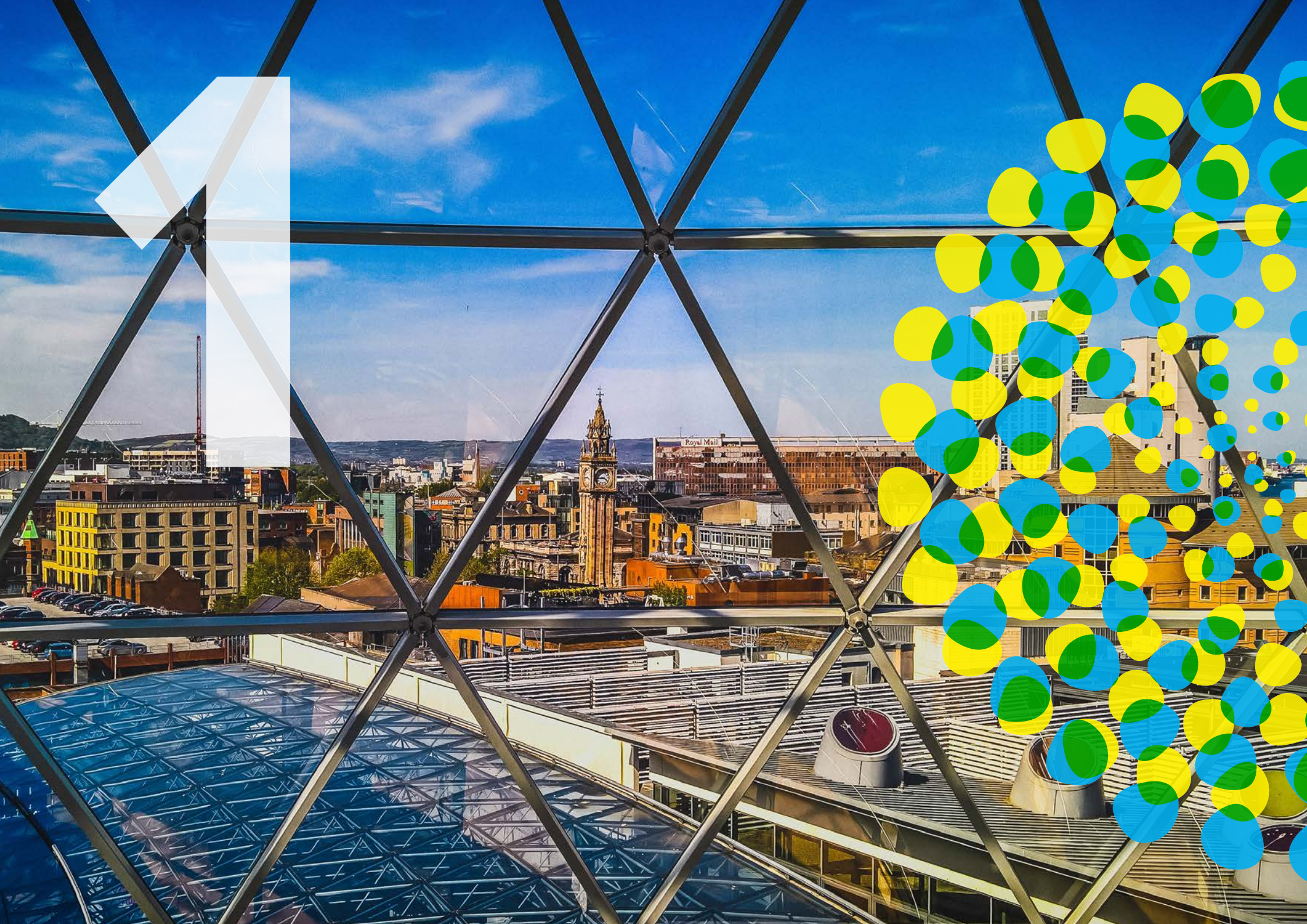
This demand warrants detailed appraisal in terms of its returns for Belfast and Dublin and its impact on the wider construction sector.

HomeLab also has significant potential to identify challenges and potential solutions within regulatory barriers that will hamper the roll out of circular construction.

Plate and RegenPorts would benefit from further targeted engagement with key partners and stakeholders prior to appraisal.

Where capital investment is not immediately available, the Connect option represent a valid and impactful option in accelerating the transition to a Connected Circular Economy for Belfast and Dublin.

Alongside these considerations, it will remain important for the circular economy to become more embedded within strategic frameworks for both City Councils.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INTRODUCTION

1. INTRODUCTION

Dublin and Belfast City Councils have developed working relationships around areas of mutual benefit. Both City Councils are members of the Dublin Belfast Economic Corridor, and have established the Four Mayors Partnership with Liverpool City Region and Greater Manchester, committed to co-operating on climate action and innovation to reach net zero goals.

The Circular Economy was identified as an opportunity for both cities to jointly explore to support economic resilience and sustainability. In June 2023, M-CO was commissioned by Belfast City Council and Dublin City Council, under the Shared Island Fund, to undertake a feasibility assessment for Circular Economy Hubs that would establish a pathway to realising a Connected Circular Economy between Dublin and Belfast.

The purpose of the feasibility assessment is to consider what both City Councils could do to enable a Connected Circular Economy by leveraging existing strengths of each local authority and the innovative capacity of private enterprises and community sectors operating within and adjacent to the Dublin Belfast Economic Corridor.

Circularity is a key instrument for climate change mitigation and strengthening local communities and is critical in underpinning the sustainability and vitality of the future economy.

Future policy and procurement frameworks will also drive innovation through circular economic models and create significant opportunities for businesses, where they are ready and enabled to take advantage of those opportunities.

The transition to a more circular economy requires changes across value chains, including product design, new business models, novel ways of turning waste into a resource, along with changes to consumer behaviour.

Cities and regional clusters can enable this transition by closing waste and material loops and providing platforms for implementing, demonstrating, and replicating transformative circular solutions.

The ambitious vision for a Connected Circular Economy between Belfast and Dublin presents significant opportunities for sustainable growth, employment, and skills development, including in the social economy sectors.

REPORT FRAMEWORK

This feasibility report follows the guidance of a Strategic Assessment Review (SAR) approach outlined in the Government of Ireland Public Spending Code, integrating key elements of the Strategic Outline Case (SOC) approach under the Northern Ireland Guide to Expenditure Appraisal and Evaluation.

This report, therefore, has a particular focus on the investment rationale and the strategic fit of the Connected Circular Economy Hubs project.

This SAR/SOC assessment will enable more in-depth consideration of Emerging Preferred Options as the appraisal process

develops to a final business case (referred to as a 'full business case under the Northern Ireland Guide to Expenditure Appraisal and Evaluation).

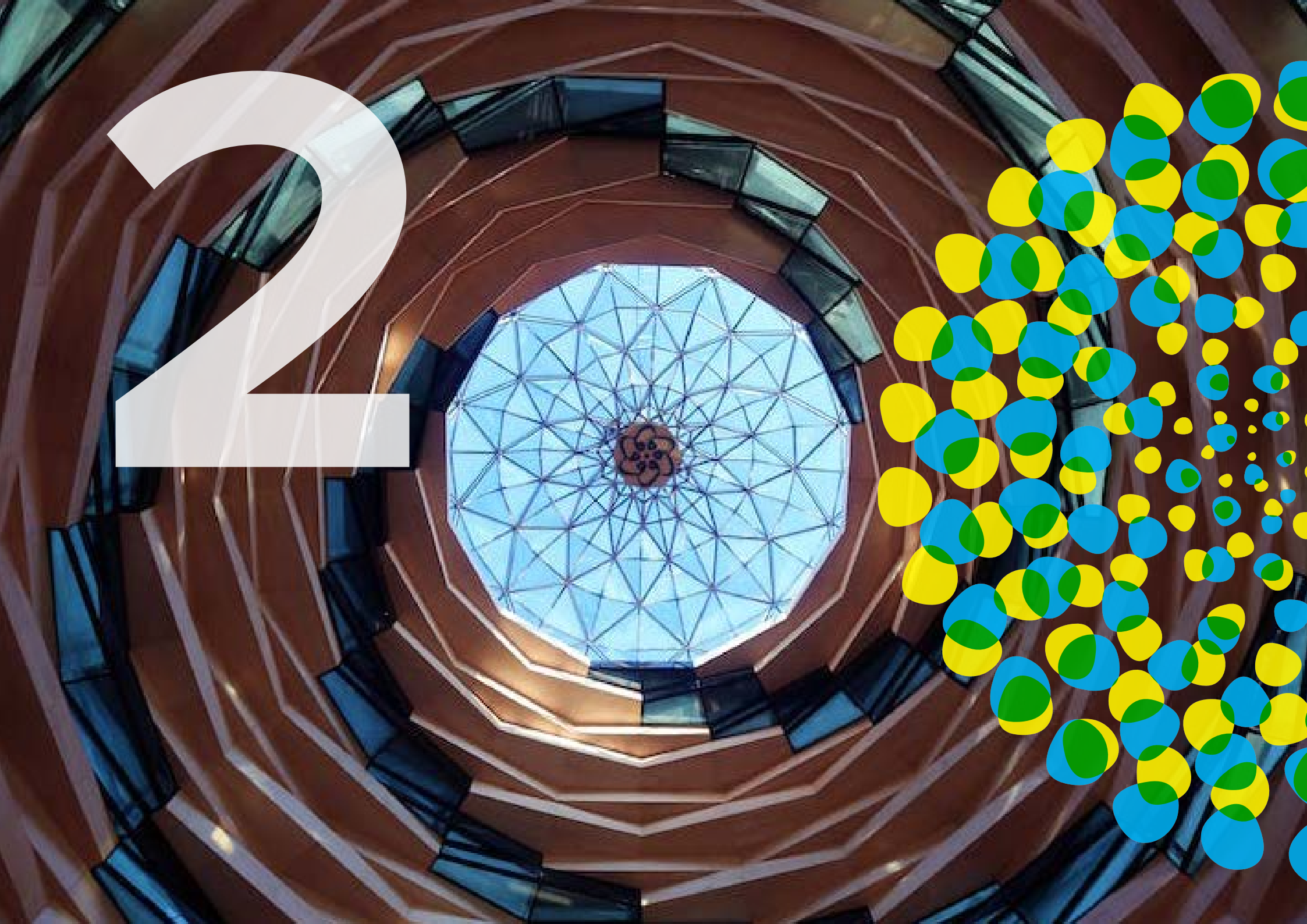
ASSESSMENT APPROACH

Scoping the potential of Circular Economy Hubs is a wide-ranging project. To develop a robust evidence base for this SAR/SOC feasibility assessment, a mixed methods approach was used.

Research was undertaken between June and September 2023 and overseen by a Project Steering Group with key staff from Belfast City Council and Dublin City Council and an Expert Advisory Group of technical, policy, and enterprise experts (see Annex 1).

Over the course of completing this feasibility assessment, seven main strands of activity were progressed:

- **Assessment of policy and strategy context -** encompassing policy and strategy initiatives and published research related to the circular economy and EU and UK levels, Ireland and Northern Ireland levels, and at city region level for Belfast and Dublin.
- **Review of the circular economy and wider enterprise landscape** – a detailed review was carried out of existing circular economy activities in Belfast and Dublin and the enterprise structure of the two cities and the Dublin Belfast Economic Corridor.
- **Analysis of secondary demand data** – on business demography, wider socio-economic indicators, and available data from the EU Circular Economy Framework.
- **Analysis of international Innovation and Circular Economy Hubs** – this part of the study involved analysing secondary data to get a quantitative view and carrying out in-depth interviews with hub managers for qualitative perspectives.
- **Primary Stakeholder research** – this involved two workshops in Belfast and Dublin with over 50 attendees representing key stakeholder groups including national and local policy makers, business representative groups, operators of innovation centres, regulatory agencies, higher education institutes, research performing organisations and environmental NGOs. A series of primary interviews with other key stakeholders were also carried out to inform the process. (See Annex 2)
- **Multi-Criteria Analysis (MCA)** – leading to a ranking of options and the identification of Emerging Preferred Options.
- **Capital and operational planning for Emerging Preferred Options** – including development of an outline vision and approach, service model and identification of target sectors, translation of available data into core assumptions for capital and operational costs, occupancy rates and rental income, recommendations for space utilisation and circular enterprise support services, and high level financial modelling.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PROJECT RATIONALE

2. PROJECT RATIONALE

This section outlines the project rationale and case for change. It also gives an overview of the context in terms of National and City policy, the evolution of Circular Economy Hubs and the opportunities for a Connected Circular Economy Hub between the cities of Belfast and Dublin.

CASE FOR CHANGE

To reach Net Zero, a fundamental shift is needed in the way we produce and consume products, buildings, food, and services, which accounts for approximately 45% of Greenhouse Gas Emissions (Ellen McArthur Foundation, 2019). This means developing a circular economy.

Cities can play a pivotal role in the transition to the circular economy and this transition is critical if Belfast and Dublin are to remain competitive, attract investment and ensure resilience against global supply chain vulnerabilities.

Belfast and Dublin are key economic drivers on the Island of Ireland, each with a high density of businesses and retailers. They are also concentrated points of material flows in Ireland and Northern Ireland. The two cities also contain a significant proportion of the population with over two million people living in the eight Council areas in the Dublin-Belfast Economic Corridor, of which 44% live in Belfast and Dublin (Blair et al., 2020).

Policy and regulatory drivers will demand a shift in business practices towards a circular economy model in the years ahead. While the business sector has a broad awareness of this policy direction, the clear absence of readiness within individual businesses is a significant economic threat. This needs to be addressed to sustain economic growth in the circular economic models that will become central to trade and commerce in the coming years.

There are unique opportunities arising from a Connected Circular Economy between Belfast and Dublin, particularly in terms of infrastructure, ports and the potential to support complementarity in approaches to the circular economy. These approaches can underpin innovation and economies of scale for key productive sectors in both jurisdictions.

The development of Connected Circular Economy Hubs is the catalyst required to enable the transition of Belfast and Dublin to a circular economy at the pace and scale required.

KEY NATIONAL POLICY DRIVERS

The Government of Ireland and the Northern Ireland Executive are committed to moving towards a circular economy and are establishing a supportive policy context to enable this. This includes an improved regulatory system, enterprise support at different levels of enterprise maturity, fiscal incentives, research programmes, public engagement, communications, and targeted networks. Key current and emerging polices and strategies include:

Northern Ireland

Through the Department of Agriculture, Environment & Rural Affairs (DAERA), the Northern Ireland Executive issued a joint statement committing to the delivery of key aspects of the EU Circular Economy Package alongside the Governments of England, Scotland, and Wales.

This commitment builds on the UK Government's 2018 Resources and Waste Strategy, which places a strong emphasis on sustainable production, resource recovery, reducing food waste, and research and innovation. UK commitment to the circular economy is further emphasised in the 2021 UK Net Zero Strategy.

DAERA is developing an Environment Strategy for Northern Ireland that sets out longterm environmental priorities. Within this strategy, the transition to a circular economy is identified as a priority.

The Northern Ireland Department for the Economy is developing a Circular Economy Strategy for Northern Ireland. This strategy will be a key enabler of the Department's 10X Economic Vision for a decade of innovation.

Ireland

The Government of Ireland's Waste Action Plan for a Circular Economy and the All of Government Circular Economy Strategy provide the policy context for delivering on the Irish Government's Climate Action Plan and EU Circular Economy Legislative Package.

Both Ireland and Northern Ireland

Both Ireland and Northern Ireland have also set ambitious policy targets for the transition to a circular economy, including:

- Northern Ireland – by 2050, reduce annual material footprint to 8 tonnes per person
- Ireland – by 2030, improve circular material use rate to above EU average.

These policy targets are bold, reflecting the scale of change needed. In 2020, Ireland had the second-lowest circular material use rate in the EU at 2%, well below the EU average of 12.8% (Eurostat). The Northern Ireland Circularity Gap Report 2021 notes that Northern Ireland's annual material footprint was 16.6 tonnes per person, well above the UK average of 5.5 tonnes per person.

Both Ireland and Northern Ireland see the development of a circular economy as a means to enhance economic competitiveness. The European Commission forecasts that the application of circular economy measures will increase the EU's GDP by an additional 0.5% by 2030 (European Commission, 2020), while it is estimated that a 5% improvement in Ireland's circularity rate would result in annual savings of €2.3 billion to the Irish economy (CIRCULÉIRE, 2019).

KEY CITY-LEVEL POLICY DRIVERS

To date, circular economy ecosystems have been evolving in a fragmented manner in Belfast and Dublin. Both cities are directly and indirectly supporting a range of circular economy initiatives such as the MODOS Circular Economy training

programme and the Rediscovery Centre in Dublin and SoCircular, and repair and reuse networks in Belfast. However, the concept of a Circular Economy is becoming increasingly prominent in policies from both City Councils.

In the Draft Economic Strategy for Belfast 2022 – 2030, Belfast City Council sets out an objective to '*deliver the innovation and investment required to create a sustainable, resilient, and circular economy*'.

In the Dublin City Development Plan 2022-2028, the City Council commits to supporting the 'growth of the 'green economy' including *renewable energy, retrofitting, and electric vehicles and charging infrastructure. and to support the transition towards a circular economy*'.

This increased policy focus provides an opportunity for both City Councils to collaborate in developing circular economy initiatives.

OPPORTUNITIES FOR A CONNECTED CIRCULAR ECONOMY

The North South Ministerial Council issued a Joint Communique in 2020 outlining opportunities for cooperation on environmental issues within the work programme, including the circular economy, water, and urban wastewater services areas.

There was a focus, in this Joint Communique, on identifying strategies and activities which would contribute to a coherent All-Island approach to achieving sustainable development.

In their report, Shared Island Shared Opportunity, the National Economic and Social Council emphasised the importance of working towards 'All-Island Opportunities from a Circular Economy and Bio-economy'. They identified the potential to support the shift to a circular economy in Northern Ireland, in Ireland and the rest of the UK, given the potential economies of

Figure 1: Dublin-Belfast Economic Corridor

scale and the resulting opportunity to gain competitive advantage.

The National Economic and Social Council outlined potential initiatives such as All-Island producer-responsibility initiatives, an All-Island approach to the circular economy and a Shared Island approach to reuse and repair. They recommended working with existing networks and platforms, such as TCD's AMBER centre, the Rediscovery Centre, Community Resources Network Ireland, Northern Ireland Resources Network and Circuléire.

There are also several economic strengths such as aligned value and supply chains including agri-food, pharmaceuticals, construction, dairy. There is also significant cross border trade worth €9.5bn annually (InterTrade Ireland, 2023), a shared labour force with at least 30,000 commuters crossing the border daily and a Single Electricity Market that provides a robust model of cross-border cooperation (Centre for Cross Border Studies, 2022).

ROLE OF CIRCULAR ECONOMY HUBS

International experience indicates that Circular Economy Hubs are key enablers and catalysts in the transition to a circular economy within cities and regions. Circular Economy Hubs are typically buildings, digital platforms or networks that address the needs and economic context of their cities and in doing so serve as key agents and brokers in driving the transition from linear to circular economic models, whether targeted at specific sectors, or operating across multiple sectors.

A 2021 European Circular Economy Stakeholder Platform survey of circular economy hubs highlighted that the hubs provide different services and carry out several types of activities based on the goals, sectors of interest and stakeholders targeted. The main activities are:

- Education, awareness-raising, capacity building, and training.
- Supporting the creation of new business models.
- Fostering industrial symbiosis.
- Providing expertise, advice and disseminating good practice.
- Establishing investment funds and accelerator programmes.
- Research, pilot projects and studies.
- Providing communication support and publishing.
- Organising events, seminars, and conferences.
- Participating in the development of public policy.
- The survey suggested that key Success Factors for Circular Economy Hubs are:
- A clearly defined mission and vision.
- Support from public or private institutions for funding and legal support.
- Clearly articulated objectives and goals for the short, medium, and longterm.
- Strong networks at a local, national, and international level.
- Clear understanding of the context and stakeholder needs.

The survey also outlined that the key barriers facing Circular Economy Hubs include:

- Lack of stable financing.
- Lack of Government support – no national or regional leadership.
- Limited experience of establishing and running a hub.
- Lack of knowledge of how other hubs operate.
- Lack of knowledge of available connections, incentives, and initiatives.
- Not being able to pool resources with other hubs.

The key insights from this survey provide useful guidance for the development of new circular economy hubs.


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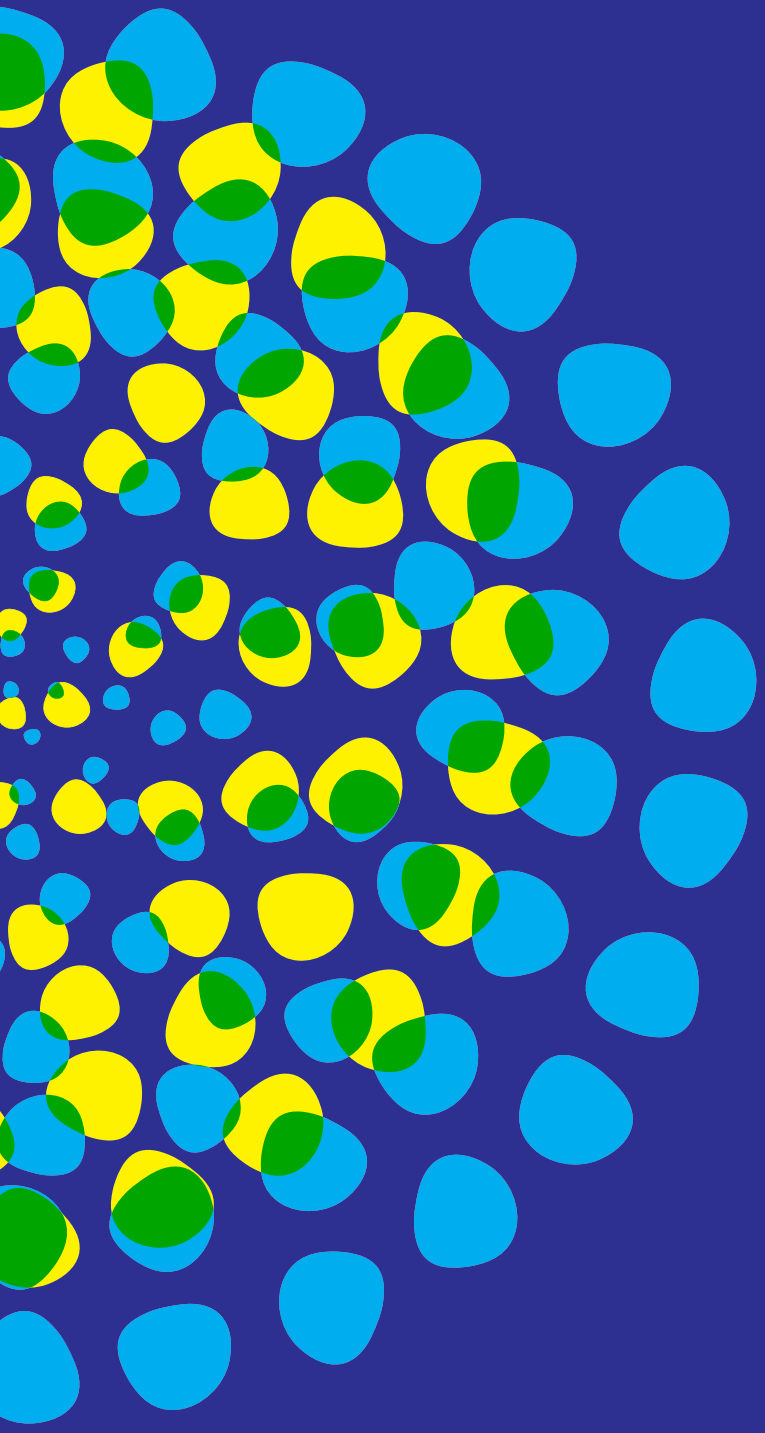

PROJECT OBJECTIVES

3. PROJECT OBJECTIVES

The overarching aim for Connected Circular Economy Hubs is to deliver on five key objectives across environmental, economic, and broader urban and socio-economic development, for the Island of Ireland.

This section outlines the key considerations for delivering on the objectives of a Connected Circular Economy. Connected Circular Economy Hubs will have a role in overcoming a range of market and systems failures at a city level.

These objectives were drafted based on the brief, discussion with the City Councils, a workshop consultation and input from the Expert Advisory Group.

Objective	Focus
Support the establishment of and scaling-up of circular economy businesses and social enterprises in Belfast, Dublin (and potentially along the Dublin-Belfast Economic Corridor).	New and early-stage business
Support businesses and social enterprises in their transition to circularity through targeted engagement.	Existing business
Increase circular material use rate along the Dublin-Belfast Economic Corridor, through businesses engaged.	Waste reduction / security of supply chains
Identify circular economy barriers at city region level and explore opportunities to address these barriers so that Belfast and Dublin can advance strategic aims for the circular economy, material flows, productivity, inclusive growth and innovation.	Innovation / demonstration/ Connectedness/reducing displacement
Contribute to Belfast and Dublin achieving Net-Zero emissions by 2050.	Climate Action

CIRCULAR ENTERPRISES BARRIERS

When considering existing and early-stage businesses, it is important to be clear on some of the challenges they face when transitioning to a circular economy. Key challenges include:

Weak External Pressures & Incentives
For SMEs and micro-SMEs, the market signals for investing in the circular economy can be weak. They lack the resources for market research, horizon scanning or participation in sectoral networks. These unclear market demands are reinforced by a lack of policy incentives, few favourable tax incentives or consumer subsidies.

Lack of Skills and Resources
Transitioning to a circular economy typically requires new skills, mindsets and resources. Many SMEs in Ireland are highly dependent on the local supply of skills so their capacity to increase their skills base is limited.

Limited Access to Finance
Businesses often mention the difficulty in raising finance for circular economy projects from internal and external sources, such as banks and investors. This challenge is being addressed at a European and UK level through Sustainable Finance Taxonomies.

Inflexible Business Models
A key barrier to the transition to circular business models is that companies remain aligned to and directly or indirectly locked into their existing business models. For SMEs, this can be due to the fact they are Tier 2 or Tier 3 suppliers locking into supply chain requirements.

Innovation Capacity
The low level of innovation capacity in some businesses can be observed through factors such as a traditional mindset among senior management and a lack of horizontality among different business functions.

Access to Information
A frequently cited barrier to circularity in smaller businesses is a lack of understanding in relation to the implications of the shift to a circular economy.

CIRCULAR ENTERPRISES STRATEGIES

There are a number of fundamental strategies for designing circular products and business models. These include:

Narrowing Resource Loops – processing improvement, product dematerialisation and light-weighting, circular supply chains, material substitution and designing in energy efficiency.

Slowing Resource Loops – extending product lifetimes (e.g., design for maintenance, modularity and durability) as well as extending utilisation through Product Service Systems such as maintenance, repair, remanufacturing and product sharing services.

Closing Resource Loops – products, services, and business models where materials are recycled in a closed-loop fashion at the end of use or that recycled materials are primary inputs.

Regenerating Resources – using non-toxic bio-materials and renewable energy.

Informing Circularity – using digital technologies to facilitate circularity such as through improved logistics.

There are also opportunities in terms of ‘cascading loops’ by cycling materials and resources between product groups and categories. This has been achieved through industrial symbiosis or direct use of materials streams from one sector into another.

CIRCULAR MATERIAL USE RATE

To monitor the progress towards the circular economy, Eurostat manages an EU Monitoring Framework on the circular economy. The Northern Ireland (Draft) Circular Economy Strategy also commits to developing an outcomes-based monitoring framework. The Eurostat Monitoring Framework is split into the following five thematic areas of production and consumption, waste management, secondary raw materials, competitiveness and innovation and global sustainability and resilience.

It includes 27 indicators such as material footprint, resource productivity, consumption footprint, greenhouse gas emissions from production activities and material dependency.

One of the indictors is the Circular Material Use Rate which measures the ratio between recycled materials and overall material use. A higher Use Rate indicates greater use of recycled materials, which in turn reduces the need to extract raw materials and the related environmental impacts.

While Connected Circular Economy Hubs will be monitoring several indicators, the Circular Material Use rate is one option to compare activities between Belfast and Dublin. Another option would be to consider the circularity gap as an indicator, as utilised in the Northern Ireland Circularity Gap Report.

CIRCULARITY & CLIMATE CHANGE

Globally, the production and consumption of buildings and products account for almost 45% of greenhouse gas emissions. The extraction and processing of resources through mining and farming accounts for 90% of biodiversity loss and water stress (UN International Resource Panel, 2019).

This means that climate mitigation strategies focussed on energy efficiency and renewable energy will only contribute 55% towards our target of Net Zero/carbon neutrality by 2050.

A circular economy and improved resource efficiency are therefore key to achieving our climate and resource efficiency policy targets and will also increase competitiveness, employment, and innovation.

In terms of reducing greenhouse gas emissions through a circular economy, some of the key materials are cement, aluminium, steel, plastics, and food. These account for almost half the emissions from production and consumption at 9.3 billion tonnes of CO_2 equivalent (tCO_2e) in 2050 (Ellen MacArthur Foundation, 2019).

According to the UN Environment Statistics, extending circular economy practices to the energy system from generation through to storage transmission, distribution and consumption would reduce carbon emissions by 72%.

SYSTEM BARRIERS

In addition to barriers facing businesses, there are several systemic barriers to the transition to a circular economy. An overview of these barriers and their relationship with governance in cities is set out in Figure 2 opposite.

ROLE OF CITIES IN SUPPORTING THE TRANSITION

When considering how Connected Circular Economy Hubs will address system barriers at a city or regional level, it is important to be clear on what policy interventions City Councils can deliver. Some of the key interventions include:

- **Addressing system and market failures** - related to information asymmetries and finance such as project development assistance and investor platforms.
- **Reducing the cost of doing circular business** (e.g., business/commercial rates relief for circular start-ups, subsidised managed offices).

- **Rectifying regulatory and planning barriers** such as waste byelaws and zoning.
- **Co-creating appropriate enabling infrastructure for a circular economy** (e.g., material banks, logistics, R&D facilities).
- **Actively steering and stimulating market activity** by setting targets, circular public procurement and facilitating sustainable behaviour in the public.
- **Investing in innovative pilots, support innovative start-ups and circular R&D** (e.g., challenge funds and forward procurement).

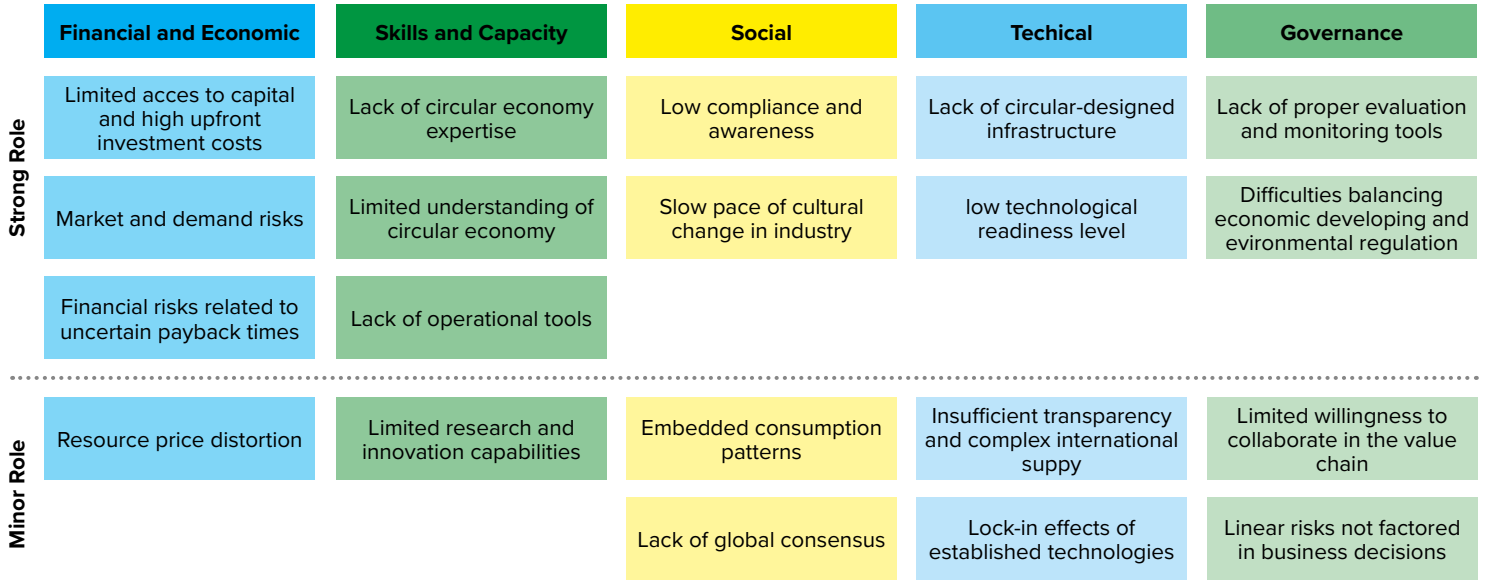

Figure 2: The Role of Cities in relation to Circular Economy System Barriers


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BACKGROUND REVIEW AND CONTEXT

4. BACKGROUND REVIEW & CONTEXT

This section presents the background review for the project. It sets out a high-level overview of demographics, skills base, labour supply, and the economic importance of Belfast and Dublin. It draws on insights from a wide range of economic strategies, policies and city development plans and sets these in the context of the circular economy.

The section also notes challenges and targets for climate action, relevant to the potential of the circular economy and the important enablers that Belfast and Dublin have in place to assist enterprises and communities to benefit from the opportunities arising from the transition to a circular economy, including growing individual skills potential, enabling collaboration and innovation, and future employment in the circular economy.

BELFAST

Belfast has a rich industrial heritage and has been successfully transitioning to a post-industrial city through the delivery of transformative regeneration projects from the Lagan Waterfront and Titanic Quarter to Victoria Square and the new Ulster University Campus.

Belfast is home to a vibrant and diverse enterprise base, with a strong focus on future technology and a knowledge-based economy enabled by excellent digital infrastructure and a young, talented workforce. Approximately 20% of Northern Ireland's population live in Belfast.

Belfast is a Growing City

Belfast is working to enable population growth of 66,000 people by 2035, which would result in a total population of over 400,000. To meet this growth, Belfast will need approximately 31,600 new homes by 2035 (Belfast Agenda, 2023). In addition to the new housing requirements, Belfast has an aging housing stock and high levels of fuel poverty that requires significant levels of renovation and retrofitting. Realisation of these housing-related programmes, along with the continuing commitment to urban regeneration, will drive significant construction investment, while the growth in population will see increased consumer demand within the city.

Belfast as an Economic Driver

Belfast accounts for one-third of Northern Ireland's Gross Value Added (GVA). The city is home to almost 50% of Northern Ireland's professional, scientific, and technical jobs, a strong creative industries sector, and almost 25% of Northern Ireland start-ups (Belfast Chamber). This city is ranked as the fifth leading city in the UK for Foreign Direct Investment (FDI) projects and Europe's leading FDI destination for new software development. Belfast also has a strong tourism sector. In 2023, the city was awarded 'World's Best Conference Destination' for the third consecutive year. Visit Belfast is also identifying that tourism growth in the city is on track to exceed

pre-pandemic levels in 2024. These figures are boosted through significant cruise travel with 141 cruise ships visiting Belfast Harbour in 2022, in addition to 1.8m people travelling through the port on passenger ferries. In terms of trade in goods, Belfast Harbour is the fifth busiest commercial port in the UK, handling almost 25m tonnes of trade every year, over six times more than the second largest port in Northern Ireland (in Warrenpoint).

Belfast's Energy and Resource Demand

In 2020, Belfast's energy-related greenhouse gas emissions were approximately 1.5 million tCO_2e per year (Belfast Climate Commission, 2020). Currently, 39% of Belfast's emissions come from the domestic housing sector, with transport responsible for 20% of emissions, public and commercial buildings for 24% and industry 18%. Belfast's roadmap for decarbonisation aims to achieve an 80% reduction in emissions by 2030.

How Belfast is Thinking about the Future.

The Belfast Agenda (Draft) 2023-2027 is the strategic plan for Belfast. Its vision includes the ambition for sustainable, inclusive growth and a more environmentally sustainable city. Some of the key priorities set out in the Belfast Agenda include the creation of innovation, research and skills hubs, £1 billion investment in neighbourhood assets, 1.5 million square feet of Grade A office space and a 15% increase in the use of sustainable transport.

The Belfast Agenda identifies housing-led regeneration as a priority. The plan recognises that 39% of greenhouse gas emissions are emitted from houses and investment of £1.5bn is targeted for the retrofitting of 100,000 homes in the city.

DUBLIN

Dublin is the engine of the economy of Ireland and hosts a vibrant enterprise base, including global technology providers, a diverse start-up community and strong SME base that creates economic and social value. Dublin is home to many world-class research institutes, with a clustering of research centres that help drive innovation and digitalisation. Dublin City is home to about 11% of Ireland's population, with over 40% of the population being in the greater Dublin area (Dublin Chamber, 2021).

Dublin is a Growing City

By 2028, Dublin City Development Plan notes the requirement to accommodate between 20,120 and 31,520 more people, up to an overall population target of between 625,750 and 640,000 people by 2028. The plan also sets out the requirement for housing need. The city needs to provide for about 40,000 housing units between 2022 and 2028. The land-capacity analysis undertaken for the City and County Development Plan show that there is enough zoned land to accommodate about 50,000 housing units (Dublin City Council Development Plan).

Project Ireland 2040 envisages that the population growth of Dublin City and its suburbs will be between 20 – 25% (2016 - 2040) with up to 290,000 additional people living in Dublin by 2040. This will see sustained demand within the city in relation to construction and available land and property as places to live and work.

Dublin as an Economic Driver

Dublin accounts for just over 40% of the state's total GVA and 30% of Ireland's working population (Dublin Chamber). The city is home to significant FDI in tech, software, pharmaceuticals, and financial services. Dublin is also Ireland's leading destination for tourism with the majority of Ireland's oversees visitors focusing their time on the capital city. For example, in 2019, out of the nine million tourists that visited Ireland, 5.9 million of these spent all or part of their time in Dublin (Dublin

City Council). This large, continual influx of tourists is a key driver in Dublin's economy, specifically for the food and hospitality sectors.

To this, Dublin's food and drink manufacturing industry has an annual turnover of €27.5 billion (Bord Bia). In terms of trade in goods, Dublin Port accounted for 47.8% of the total tonnage of goods handled in 2018 and for 63% of all vessel arrivals in Irish ports in 2023 (Dublin Port, 2023).

Dublin's Energy and Resource Demand

Dublin's energy related greenhouse gas emissions are 5,969,000 (tCO_2e) per year (Codema, 2022). Heating buildings accounts for 46% of energy related emissions, 28% is related to transport and 26% is electricity.

The sectors that have the highest impact on emissions are the residential and transport sector, which combined, contribute around 57% to total energy-related emissions. To achieve its 2030 climate targets, Dublin City needs to reduce greenhouse emissions by 2,856,000 tCO_2e.

How Dublin is Thinking about the Future

Key elements of the Dublin City Council Economic Strategy include the ambition to safeguard and enhance Dublin's role as Ireland's internationally competitive capital; promoting strategic and targeted employment growth; supporting the transition to a low-carbon, green, circular economy; and fostering local economic development and social enterprise.

In order to achieve these aims while ensuring continued growth among SMEs, a coordinated approach to the provision of focused and relevant supports is required.

CIRCULAR ECONOMY ECOSYSTEMS IN BELFAST AND DUBLIN

Connected Circular Economy Hubs will complement existing programmes delivered at a city and national level while leveraging the capacity of the programmes to achieve scale and impact. There are existing circular economy support mechanisms and initiatives available in both Belfast and Dublin, with further supports in development. Some of the existing ecosystem supports, as set out in Figure 3, include:

Start-ups and small businesses need an enabling environment to establish and grow. Both Belfast and Dublin have thriving entrepreneurship and innovation ecosystems and SMEs have access to supportive and managed workspaces through a variety of enterprise hubs.

Both cities have been developing their circular economy ecosystems and their plans for growth and economic development recognise the need to develop and maintain a supportive environment in which circular businesses and social enterprises can grow.

Delivering on these needs requires the development of access to circular economy expertise, affordable workspaces, clustering, and value chain opportunities.

Business advisory services, mentoring and various forms of finance are widely available to SMEs in both cities through existing agencies.

While there are a growing number of business support services targeting sustainable and low carbon business practices, the workshops held in Belfast and Dublin highlighted clear gaps in relation to the supports targeted towards circular economy models.

CIRCULAR ECONOMY ECOSYSTEMS				
	Business and Social Enterprise Support Programmes	**Hubs and Clusters**	**Funding & Finance**	**Skills and Training**
DUBLIN / REPUBLIC OF IRELAND	• EPA Circular Economy Programme • CIRCULEIRE • Enterprise Europe Network • MODOS • Government Climate Toolkit 4 Business	• Community Resources Network • SFI plastics and food challenges • The Circular Cities Accelerator Programme (TCD Tangent) • Rediscovery Centre	• EPA Green Enterprise funding • Circular Economy Innovation Grant Scheme	• NCAD MA Design Circular Economy • Skillnet Circular Economy • Rediscovery Centre
BELFAST / NORTHERN IRELAND	• Enterprise Northern Ireland • NI Resources Network • Go, Succeed Programme • Re-Use Community Initiative • Invest NI Resource matching service • Business in the Community NI • Wrap Programme	• Advanced Manufacutirng Innovation Centre (AMIC) • The Agri-Food and BioSciences Institute (AFBI) • Queen's University Advanced Manufacturing Resource Centre • Queen's University QUILL Research Centre • Belfast Tool Library • Restore Charity Shops network Sectoral research clusters	• Invest Northern Ireland • DAERA Environment Fund 2023 - 2028 • Social Economy Enterprise Fund	• Ulster University and Queen's University Research & Doctoral Programmes focusing on Circular Economy • Belfast Retrofit Academy

Figure 3: Circular Economy Ecosystems

These gaps include:

- Knowledge gaps relating to EU and UK legislation impacting manufacturing and secondary material enterprises, data on infrastructure, materials, and procurement.
- Low levels of awareness about the circular economy among consumers.
- Lack of enterprise awareness of the opportunities arising from business model innovation.
- Lack of awareness of the commercial potential of value recovery from secondary raw materials.
- Fragmented communication initiatives.
- The current type, scale and reach of existing enterprise supports.
- The small scale of services currently available (e.g., repair and reuse).
- Scarcity and affordability of spaces for circular economy services to start-up and scale.
- A lack of regulatory enablers.
- A culture of demolition within the built environment, as opposed to the provision and use of material banks.

There is a need to put solutions in place to ensure that high potential circular economy start-ups can access sector-specific expertise, and that existing businesses can be enabled to transition to a circular economy.

As our demand analysis will show, SMEs in Belfast and Dublin risk missing out on valuable opportunities in the transition to a circular economy and not fulfilling their full growth potential.

This includes responding to emerging value chain demands, or successfully tendering for circular public contracts. There is a need to enable easier access to circular and green procurement to accelerate opportunities for SMEs in both cities.

Clustering of companies and industry sectors is a key tool for city and regional development and for national competitiveness. In the transition to a circular economy, SMEs should be encouraged and enabled to partner with other relevant industry players so that the full benefits of collaboration be realised.

While there are significant pressures to develop land for housing, there is a need to act strategically and look to areas of the city that can be utilised for industry clustering relevant to a circular economy. This includes, underutilised business and industry parks, ports, and vacant commercial properties.

Evidence from other cities suggests that innovation ecosystems, including circular economy ecosystems, are most likely to emerge in places where many conditions and drivers of growth already exist.

While the development of the Circular Economy Ecosystem in Belfast and Dublin is at a relatively early stage, many of the conditions and drivers are in place in both cities to help accelerate the transition to a circular economy at the pace and required. These are set out below:

Innovation Ecosystem Demand Drivers

There are several specific demand drivers that underpin a circular economy but many of the positive economic demand drivers are already present in both cities. For example, both cities have:

- Existing circular economy SMEs that are growing, attracting investment and can influence others to innovate. (e.g., Dublin: GoCar, FoodCloud, Belfast: Ionic Technologies).
- A base of larger, more established, and internationally oriented companies with a circular economy profile (e.g., Dublin: Google, Belfast: Caterpillar).

- Investment Networks such as Venture Capital and Angel Investors seeking sustainable and impact investments (e.g., Dublin: DogPatch, Belfast: BGF Investment Fund).
- Diverse knowledge anchors across larger R&D institutions and universities and a culture of cross-pollination of academic and commercial research, leading on IP and commercialisation).
- Research expertise in adjacent sectors (e.g., material science, bioeconomy, renewable energy).
- Access and proximity to markets
- Large consumer markets
- Large institutional purchasers of circular products (e.g., commercial semi-states).
- Public sector market prepared to procure circular products and services.
- Established social economy sector base.
- Existing pool of and ability to attract qualified talented workers in emerging circular sectors.
- An enabling policy environment with associated incentives across areas such as climate, food, energy, waste, water.

Framework Conditions for Investment

There are several key framework conditions that enable investment in innovation.

Many of these enabling conditions that will support the transition to a circular economy already exist in Belfast and Dublin. For example, both cities have:

- Access to an investment community that currently supports SMEs and start-ups (business angels, venture capitalists, investment banks) and a willingness to finance risky ventures and early stages of development.
- A mix of funding options to match different stages of enterprise development (e.g., from start-up grants through to tax breaks and technology funds).
- Policy and regulatory landscape capable of promoting innovation and circular procurement (e.g., patent lawyers).
- A strong track record of inter-firm and inter-institutional collaboration and knowledge exchange.
- Sector specific support networks (e.g., food, biosciences).
- SME opportunities for collaboration with centres of excellence such as academic and research institutes (e.g., Circuléire/ IMR, Teagasc, AMIC, AFBI).
- Support services around IP protection, open data to provide confidence on return on investment.

Enabling Infrastructure

The transition to a circular economy will require a range of enabling infrastructures to be developed across material recovery, logistics and data.

At a minimum, connections to a large city offers advantages in sectors that are complementary, and this can support the transition to a circular economy.

While there are key infrastructural challenges such as ensuring a strong supply of affordable housing, many aspects of the enabling infrastructure exist in both cities. For example, both cities have:

- Travel links to major roads and city centre rail hubs, plus convenient access to ports and airports, to support labour mobility.
- Proactive City Councils prepared to respond rapidly to changing needs and circumstances (e.g., covid emergency response).
- High quality telecommunications, digital connectivity, and reliable energy sources power.
- Attractive locations for work and leisure.
- Diverse options for commercial property.

Skills, Human and Social Capital

Having a diverse skills base and the ability to attract and retain talent is a key issue underlying the transition to a

circular economy. Additional strategic considerations need to include upskilling in industry, reskilling, transferable skills, and the Just Transition.

Currently, both cities have:

- A strong demographic profile and resilient longterm skills supply supported through viable talent attraction and retention strategies
- Availability of high-level specialist skills in diverse areas such as material science, advance manufacturing, data science, design, and architecture.
- Proximity to some product manufacturing expertise, including expertise which is embedded within existing multinational companies.
- University courses, apprenticeships and training schemes related to the circular economy.

CIRCULAR ECONOMY EMPLOYMENT OPPORTUNITIES

Both Belfast and Dublin have a young population and a highly skilled and internationally mobile workforce, ensuring there is a wealth of talent available.

A circular economy requires a wide range of job types from low to high skilled occupations as there are differences between the skills required for different circular economy activities.

Both cities can play to their strengths in the transition to a circular economy. For example, Belfast and Dublin have strong digital sectors that can enable servitisation (e.g., extending product lifetimes through service-based business models).

This would create some new skilled jobs in engineering and service delivery, as well as creating employment in areas where transferable skills are likely possible, including IT and management roles. Servitisation will also drive employment in service design, digital platforms, social media, and other sales and marketing channels.

Remanufacturing is central to circular economy, particularly in high value products or business-to-business sectors. Remanufacturing requires skilled workers, and so has high potential to increase circular jobs, particularly if manufacturing employment is contracting. There will be a need to invest in training to upskill the workforce.

For recycling, particularly open loop recycling, low-skilled jobs are likely to dominate across activities such as collection and sorting.

There is less of a requirement to invest in significant levels of training for these roles, but semiskilled and skilled jobs are likely to emerge across more technical sorting systems and logistics. Reuse and repair can generate low to medium-skilled employment in repair shops.

CIRCULARITY OF BELFAST AND DUBLIN

CIRCLE Economy, who publish the Circular Economy Gap Report for Northern ireland, produce a high-level analysis of circularity of cities across the following three themes.

- **Jobs (Full-time equivalents)** – The total number of people formally employed in different sectors in the city, obtained from statistical datasets.
- **Mass (tonnes)** - The quantity of materials that are consumed by sectors in the city. This includes all types of materials, from biomass (such as wood and food) to minerals and chemicals (such as plastics and concrete), as well as metals.
- **Emissions** - The total quantities of greenhouse gas emissions directly emitted by sectors within the city, presented in tCO_2e.

Their analysis combines over 25 data sets from seven trusted global data sources. These are combined into national profiles

that are then scaled down to city level using income and population data.

The following tables are an indication of the circularity of both cities (assumed to be the Greater Dublin Region), based on an analysis by Circle Economy (Ganbette, 2023).

Viewing cities across these three themes opens opportunities for considering opportunities for the circular economy. For example, in a sector that is both material intensive and with high emissions, such as the built environment, there are opportunities to grow employment while reducing emissions.

Conversely, service sectors have low levels of material consumption and emissions but these sectors can enable transition to the circular economy in other sectors and areas of the city.

Belfast

	Materials (ktonnes)	Emissions ($ktCO_2e$)	Jobs (thousands)
Built environment	1778	128	35298
Mobility systems	619	24.1	7719
Food systems	613	479	30689
Consumer goods	557	105	30720
Energy systems	430	83.3	22797
Water systems	2.33	3.07	834
	Data reliability is **medium**	Data reliability is **low**	Data reliability is **medium**

Dublin

	Materials (ktonnes)	Emissions ($ktCO_2e$)	Jobs (thousands)
Built environment	4499	528	56511
Mobility systems	1835	5816	99163
Food systems	1581	711	86374
Consumer goods	945	434	45983
Energy systems	560	2090	10072
Water systems	32.6	82.5	513
	Data reliability is **medium**	Data reliability is **low**	Data reliability is **medium**

BACKGROUND REVIEW SUMMARY

Belfast and Dublin city are key economic centres with strong enterprise bases across a wide range of sectors including technology, tourism and the food and hospitality sectors. Both cities have growing populations, which will lead to increased demand for housing stock and drive continuing investment in construction. Both cities also account for high levels of greenhouse gas emissions and have challenging emissions reduction targets to meet.

Within their respective plans, both Belfast and Dublin are targeting significant economic growth within an environmentally sustainable framework. Enterprise and Innovation EcosystemsBoth cities have thriving enterprise and innovation ecosystems. Key aspects of those ecosystems include:

- **Challenges and Gaps in the Ecosystems** - Engagement with key stakeholders has identified a number of gaps and challenges within circular economy ecosystems in both cities including lack of enterprise awareness of the opportunities arising from business model innovation, or the opportunities for value recovery within secondary raw materials; fragmented communication relating to the circular economy; the range and type of existing enterprise supports; the small scale of circular economy businesses; scarcity and affordability of spaces for circular economy services to start-up; and a culture of demolition within the built environment, as opposed to the provision and use of material banks.

- **Circular Economy Employment Opportunities** - Both cities have a young, highly skilled workforce, although investment in training will be needed to upskill workers for the circular economy. Both cities have strong digital sectors that can enable new jobs in servitisation. With a proximity to product manufacturing expertise, there are opportunities for new skilled jobs in remanufacturing.

- **Circularity of Belfast and Dublin** - Data from CIRCLE economy has been used to provide a high-level analysis of the circularity of Dublin and Belfast. This analysis indicates some areas of opportunity for the circular economy, including in food systems which provides a very solid employment base in both cities, or in the built environment, which is material intensive with high emissions presenting opportunities to grow employment while reducing emissions.


5

STRATEGIC ALIGNMENT

5. STRATEGIC ALIGNMENT

The transition to a circular economy is a strategic priority for the Government of Ireland, the Northern Ireland Executive, the UK Government, and the European Union. Connected Circular Economy Hubs will align with, complement, and deliver for national policy frameworks on the circular economy, and on energy decarbonisation targets in Ireland and Northern Ireland.

The Government of Ireland's Circular Economy and Miscellaneous Provisions Act 2022 sets the legislative context for delivering on the EU Circular Economy Package. In 2020, the UK Government agreed to a transposition of the 2020 EU Circular Economy Package measures, with modifications to suit their needs.

The development of Connected Circular Economy Hubs in Belfast and Dublin aligns to these national policy priorities while delivering local policy objectives across areas such as economic development, climate action and decarbonisation, urban regeneration, improved housing delivery and waste regulations.

This section provides an overview of the key areas of strategic alignment. Policies, strategies, and development plans were reviewed at EU and UK, National, and Local and Regional levels.

Figure 4 sets out an overview the key policies for Ireland and Northern Ireland at each level:

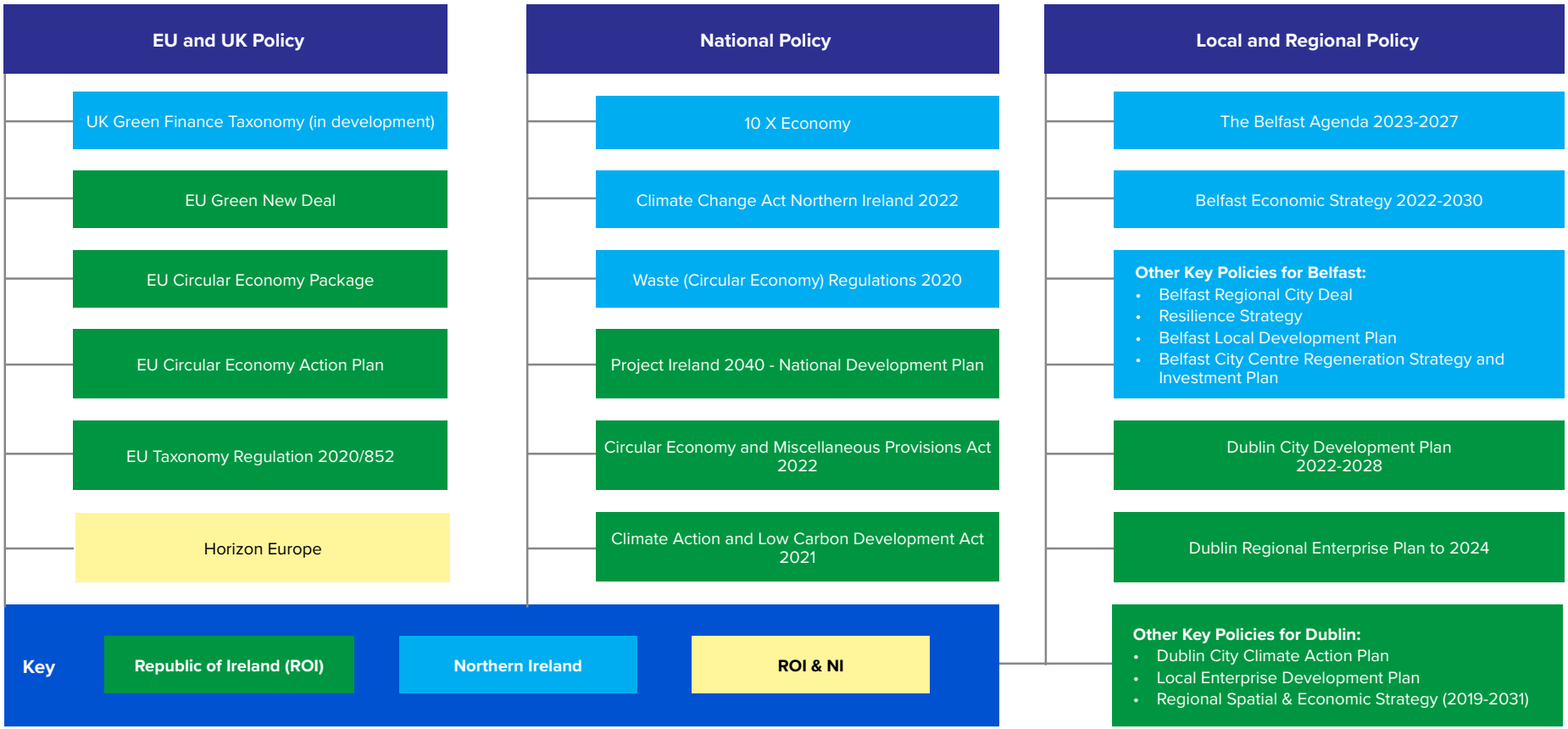

Figure 4: Summary of Strategic Alignment

The following table outlines the relevant objectives of each policy and strategy and how Connected Circular Economy Hubs will help to deliver on those objectives.

This table clearly shows that Connected Circular Economy Hubs have a strong alignment with the key EU, UK, Ireland and Northern Ireland policies and strategies. There are a wide range of additional broader policies, strategies, and plans that the project also aligns to.

Connected Circular Economy Hubs will also support engagement with EU R&D funding programmes by helping to develop networks where researchers and businesses can collaborate on proposals. In September 2023 the UK Government committed to re-joining the Horizon Europe science-research programme. Horizon is one of the most significant EU research and innovation programmes. The Irish Government also actively engages with EU funding programmes including the Horizon Europe programme.

Policy	Connected Circular Economy Hubs: Strategic Alignment
EU and UK Policy Frameworks The Connected Circular Economy Hubs will align to and complement EU policy delivery in Ireland, and the circular economy outlined in the Circular Economy Package policy statement issued by DAERA in 2020.	
EU Green New Deal	**To make sustainable products the norm in the EU, boost circular business models and empower consumers for the green transition.** Connected Circular Economy Hubs will align to the EU Green New Deal in providing facilities that support the innovation, creation, scaling and testing of circular products, services, and processes. The hubs will act as supports for new, emerging, and existing businesses, helping them to adopt more circular practices.
EU Circular Economy Package & Circular Economy Action Plan	**This Circular Economy Package targets how products are designed, promotes Circular Economy processes, encourages sustainable consumption, and aims to ensure that waste is prevented, and the resources used are kept in the EU economy for as long as possible.** Connected Circular Economy Hubs will align to the Circular Economy Package by improving re-use rates, reducing waste, and helping to incorporate sustainable circular design in the economy.
EU Taxonomy Regulation 2020/852 and UK Green Finance Taxonomy (in development)	**These taxonomies establish a framework to facilitate sustainable investment.** Connected Circular Economy Hubs will enable businesses to raise additional finance and proactive responses to demands across their value chains.

National Policy Frameworks	
A 10 X Economy	**A 10X Economy is an economic vision for Northern Ireland that sets out a vision for greater collaboration and innovation to deliver a ten times better economy with benefits for all our people.** **10X Economy sets out a series of guiding principles, including:** *Guiding Principle 2. Deliver positive economic, environmental, and societal outcomes.* *Guiding Principle 3. Support a greener, sustainable economy.* *Guiding Principle 6. Position NI amongst the most competitive small, advanced economies in the world.* *Guiding Principle 7. Focus on increasing innovation in high value-added areas and priority clusters resulting in higher wages.* *Guiding Principle 9. Position NI as an optimum place to work, invest, live, and visit.* Circular Economy Hubs will help to deliver on the 10X Economy strategy by supporting new and existing businesses, enhancing attractiveness for inward investment, contributing to environmental targets through increased circularity, reduction in waste and emissions, and enhancing quality of life for those who live in, work in, invest in and visit Northern Ireland.
Climate Change Act Northern Ireland 2022	**The Act sets sectoral targets including 2030 targets of at least 80% of electricity consumption from renewable sources and 70% of waste is recycled by 2030.** Connected Circular Economy Hubs will contribute to these National Policy targets by providing facilities that support the innovation, creation, scaling and testing of circular products, services, and processes. The hubs will act as supports for new, emerging, and existing businesses, helping them to adopt more circular practices.
The Waste (Circular Economy) (Amendment) **Regulations (Northern Ireland) 2020**	**These Regulations transpose the EU Circular Economy Package for Northern Ireland. Among other measures, the regulations:** • will promote and support sustainable production and consumption models, • encourage the design, manufacturing and use of products that are resource-efficient, durable (including in terms of life span and absence of planned obsolescence), reparable, re-usable and upgradable, • target products containing critical raw materials to prevent those materials becoming waste. Connected Circular Economy Hubs will contribute to these Regulations by providing facilities that support the innovation, creation, scaling and testing of circular products, services, and processes. The hubs will act as supports for new, emerging, and existing businesses, helping them to adopt more circular practices.

Project Ireland 2040 - National Development Plan & National Planning Framework	**National Policy Objective 56: Sustainably manage waste generation, invest in different types of waste treatment, and support Circular Economy** **National Policy Objective 44: In cooperation with relevant Departments in Northern Ireland, to further support and develop the economic potential of the Dublin-Belfast Corridor and in particular the core Drogheda-Dundalk-Newry network and to promote and enhance its international visibility.** Connected Circular Economy Hubs will contribute to these National Policy objectives by facilitating the re-use and recycling of materials, creating hard and soft infrastructure that Connects Belfast and Dublin along the Dublin Belfast Economic Corridor.
Circular Economy and Miscellaneous Provisions Act 2022 & Waste Management Plan for a Circular Economy	**The Act and National Waste Management Plan incorporates the requirements of the EU Green Deal and EU Circular Economy Package** **The Plan commits to a range of actions to support the transition to a circular economy through a mix of legislative, regulatory, and financial measures, and reconfirms the link between the circular economy and climate action, mandating a whole-of-Government approach to ensure Ireland's successful transition to a circular economy.** Connected Circular Economy Hubs will contribute to these National policy objectives by providing facilities that support the innovation, creation, scaling and testing of circular products, services, and processes. The hubs will act as supports for new, emerging, and existing businesses, helping them to adopt more circular practices that can ensure Ireland's successful transition to a circular economy.
Climate Action and Low Carbon Development (Amendment) Act 2021 & National Climate Action Plan	**The National Climate Action Plan recognises that the 'circular economy and climate action are inherently interlinked'. It highlights the range of measures the Government of Ireland is adopting through Waste Management Plan for a Circular Economy to support reduced resource consumption, waste prevention, and increased levels of re-use and recycling.** Connected Circular Economy Hubs will support this plan by providing facilities that support the innovation, creation, scaling and testing of circular products, services, and processes. The hubs will act as supports for new, emerging, and existing businesses, helping them to adopt more circular practices.

Local and Regional Policy Frameworks The Connected Circular Economy Hubs will ensure the delivery of local and regional policies in both Belfast and Dublin and will be a catalyst for achieving several strategic objectives.	
The Belfast Agenda 2023-2027 (updated draft)	**Enable the city to decarbonise at scale by developing a Belfast Local Area Energy Plan and use it to shape and drive investment in decarbonisation measures (for example heat pumps, insulation, solar panels) across the city.** **Actively promote sustainable circular economy approaches to transform our throwaway economy into one where waste is eliminated, resources are circulated, and nature is restored.** Circular Economy Hubs will contribute to the delivery of this strategy by supporting businesses in Belfast to transition to a circular economy.
Draft Economic Strategy for Belfast Executive Summary 2022 – 2030	**Shortlisted Policy 4 - Enabling a path to Net Zero: Belfast will deliver the innovation and investment required to create a sustainable, resilient, and circular economy.** Circular Economy Hubs will contribute to the delivery of this strategy by supporting businesses in Belfast to transition to a circular economy, and delivering the innovation and investment required to create a sustainable, resilient, and circular economy.
Dublin City Development Plan 2022-2028	**CA9 - Climate Adaptation Actions in the Built Environment - Development proposals must demonstrate sustainable, climate adaptation, circular design principles for new buildings / services / site. The Council will promote and support development which is resilient to climate change.** **CA23 - To support the shift towards the circular economy approach as set out in a Waste Action Plan for a Circular Economy 2020 to 2025, Ireland's National Waste Policy, as updated together with The Whole of Government Circular Economy Strategy 2022- 2023.** Connected Circular Economy Hubs will contribute to the delivery of the Dublin City Development Plan by supporting businesses, social enterprises, and construction projects to more towards a green and more circular economy.
Dublin Regional Enterprise Plan to 2024	**Strategic Objective 4: Enable and position businesses as leaders in Dublin's low carbon transition.** Connected Circular Economy Hubs will support this plan by aligning to the wider Dublin circular economy Ecosystem, in particular, the hub emerging in the Guinness Enterprise Centre.


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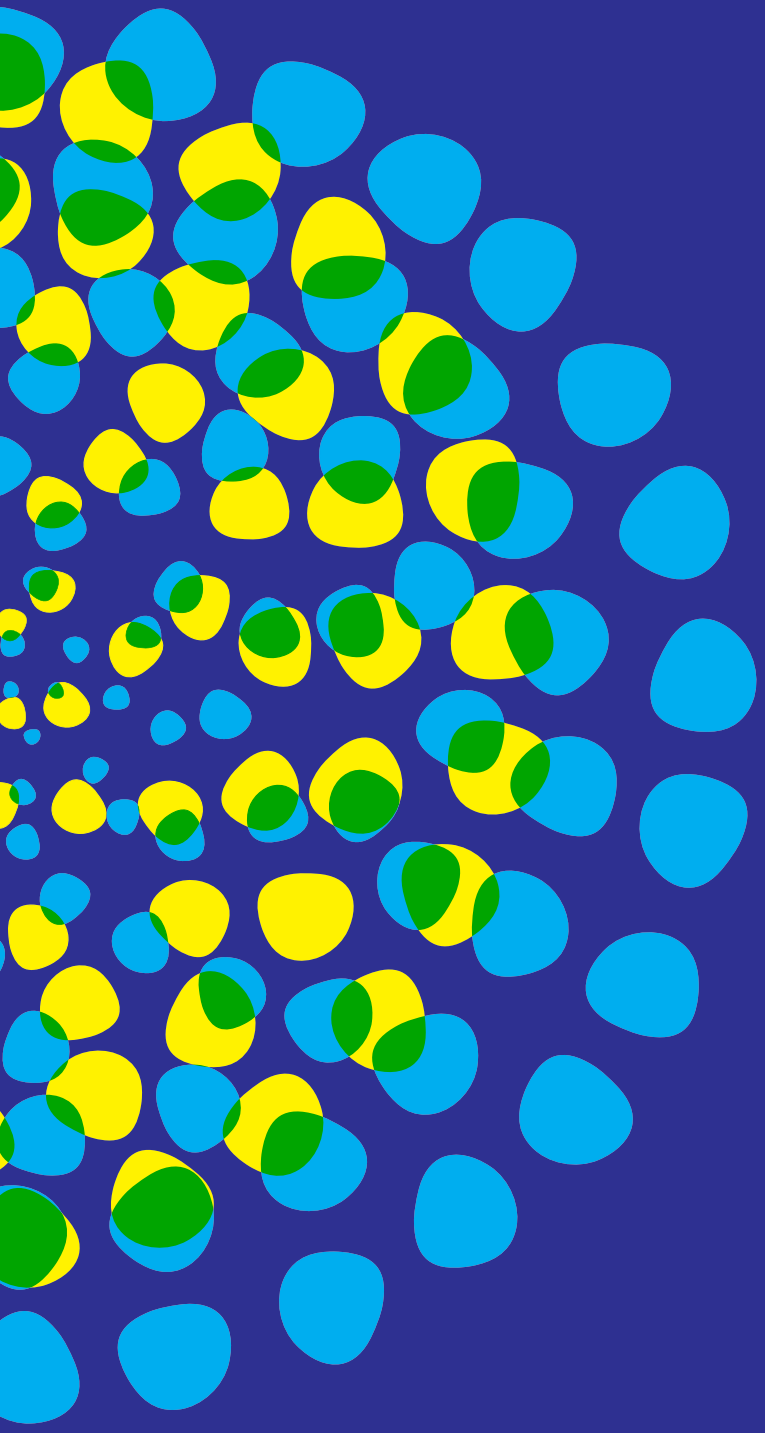


INTERNATIONAL INSIGHTS AND LESSONS LEARNED

6. INTERNATIONAL INSIGHTS AND LESSONS LEARNED

A key part of the study was to research existing comparable projects to identify learnings and best practice. To develop a comprehensive view, the research focussed on four areas:

- **Review of Innovation Hubs** – a high level review of Innovation Hubs was undertaken with a focus on infrastructure and key success factors
- **Review of City and Regional Circular Economy Strategies** - a rapid assessment of 72 city and regional circular economy strategies across Europe was carried out
- **Review of Existing Circular Economy Hubs** – a detailed review of existing circular economy hubs was undertaken to analyse their levels of activity and how they operate. This review included desk research and interviews with circular economy hub managers
- **Case Study Examples** – the final element of this section was to identify six case studies of successful Circular Economy Hubs from different countries and review what they had in common and where they differed.

REVIEW OF INNOVATION HUBS

Circular economy hubs are a relatively new initiative, but the innovation hub is a well-established model that has many similarities in terms of objectives and reach. An Innovation Hub is a place where innovators can come together to share ideas, collaborate on projects, and develop novel solutions to complex problems.

Circular economy hubs have similar motivations to this albeit with a sharper focus on circular innovation. There are now a wide range of formats of innovation hubs, from dedicated buildings, districts, quarters, innovation zones, corridors, and campus-based hubs. This section examines the hard and soft infrastructure that underpins hubs, and the key factors for their success.

Infrastructure

Innovation hubs typically bring together both ‘hard’ and ‘soft’ infrastructure. This infrastructure is key to the success of the hub and the key elements are:

- **Specialist Buildings** – affordable offices, workshop spaces and labs
- **Networks** – groups of innovative businesses and clusters that collaborate, share experience, and develop opportunities.
- **Business Supports** – advisory and mentoring services assisting with business and financial planning, accelerator and start-up programmes, finance, and marketing support and research commercialisation supports.
- **Talent Attraction** – the positive profile of the hub helps tenant companies to attract and retain highly skilled employees.
- **Knowledge and Technology Transfer** – providing the infrastructures to support the growth of knowledge rich and innovative companies.

Key Success Factors

Depending on the mix of sectors being supported, there are a range of common success factors that make innovation hubs work. These include:

- **Proximity** – in order to achieve high quality collaboration between enterprises, institutions, mentors, investors, and established businesses, physical proximity is important.
- **Placemaking Considerations** – considerations that are likely to attract innovative enterprises while being inclusive and highly visible.
- **Proactive Programmes within Hubs** – which can encourage engagement, peer learning and cross-fertilisation of ideas between companies using the hubs.
- **Proactive Engagement with Wider Innovation Ecosystem** - Innovation hubs work well when they are connected into the wider innovation ecosystem which supports enterprise formation and business growth at a city or regional level.
- **Access to Land, Space or Facilities** – this allows for the development of trials and pilots at an appropriate scale, and for futureproofing through grow-on space.
- **Access to Incentives and Frameworks** - for joint ventures and risk-taking.
- **Flexible Rental and Utilisation Models** – it is important that rental models and the use of services within hubs allow for the unpredictable cash flows and growth cycles of start-up companies.
- **High Quality Digital Connectivity** – good digital infrastructure and connectivity is also a key success factor.

REVIEW OF CIRCULAR ECONOMY STRATEGIES

A review of 72 city and regional circular economy strategies across Europe was undertaken to develop an understanding of how cities develop circular economy strategies and create the context for circular economy hubs to emerge. The strategies were reviewed in terms of motivations and objectives, focus areas, implementation, and monitoring.

Motivations & Objectives

Achieving climate targets, economic opportunities, and waste targets were the three primary motivations underpinning circular economy strategies.

Strategy objectives were closely aligned with these primary motivations, with environmental protection and economic competitiveness being the most common qualitative objectives.

The main quantitative objectives focussed on waste and raw materials. A common feature of the stated objectives is that they are delivering on already defined national or city policy objectives.

Focus Areas

In terms of focus areas, waste and material circularity is core to most strategies, often with a focus on material-intensive sectors. Some cities and regions undertake circular material flow analysis and industry engagement to inform the process. The next most popular areas of focus are construction and food.

Several strategies incorporate relevant regional value chains and product lifecycles such as circular design, circular consumption, circular waste, and circular business models.

Focus areas are usually identified via expert insight and political decision-making, often in line with national policy objectives. In a small number of cities, deliberation, and public engagement was used to help select the focus areas.

Figure 5, sets out the eight most common focus areas identified in the circular economy strategies reviewed:

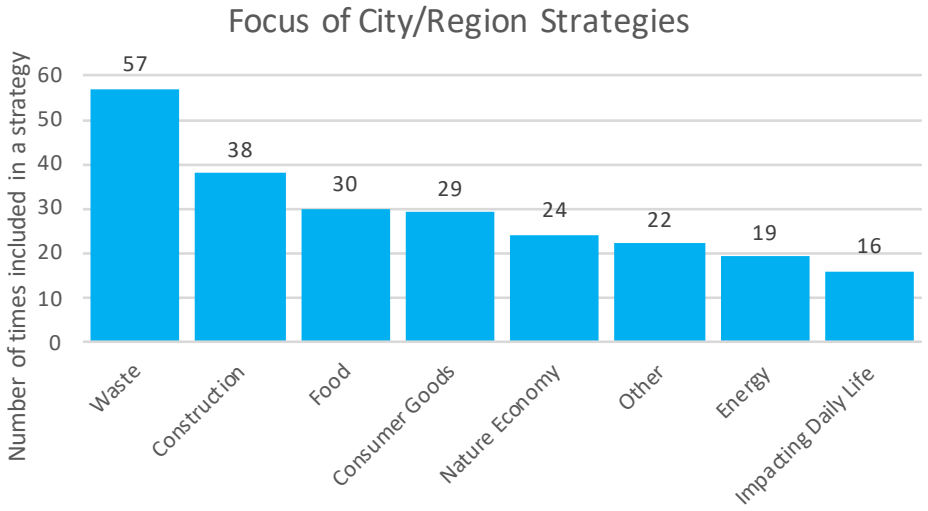


Figure 5: Distribution of Focus Areas in Circular Economy Strategies

Implementation Measures

It is important for cities to have a wide array of implementation measures at their disposal to enable the transition to a Circular Economy.

The top three activities are training, pilot projects and stakeholder engagement.

Cities and regions also benefit from a strong leadership role in shaping markets, through implementation of circular procurement measures. Figure 6 below shows the eight most prevalent implementation activities within circular strategies:

Monitoring

In general, there is a low level of monitoring of strategies. Some strategies adopt national KPI's often based on waste, secondary material, resource efficiency or through transition measures using linked or composite indicators (e.g., material efficiency, circular material rate).

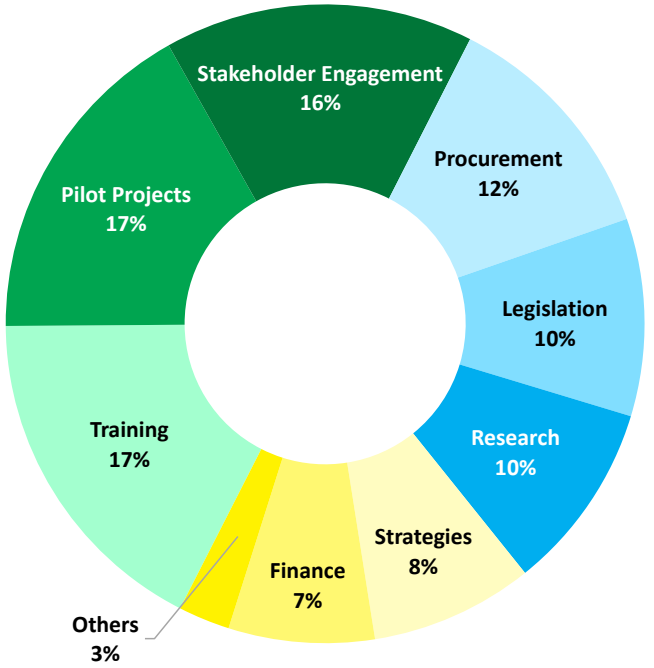


Figure 6: Implementation Activities for Circular Economy Strategies

REVIEW OF CIRCULAR ECONOMY HUBS

To better understand their role and operation, 17 Circular Economy Hubs were reviewed across different countries to identify their purpose, typical activities, scale, and priorities, operating models, and governance.

Purpose

The primary purpose of circular economy hubs is the sustainable growth of employment and new enterprises while acting as incubators for new solutions to urgent societal challenges, such as climate change and critical raw material supply risks.

Delivering on these purposes sees circular economy hubs focusing on the development of dynamic, mixed-use enterprise communities that benefit from proximity and knowledge spillovers.

There is no single model for circular economy hubs, but they involve a range of stakeholders such as business support groups, academic institutions, corporate R&D, enterprise start-ups and social innovators.

Successful models for circular economy hubs are designed around city and regional contexts, with a clear governance structure and a sustainable funding model.

Activities

Circular economy hubs deliver a range of activities and programmes with a primary focus on clustering and collaboration, capacity building and the provision of physical infrastructure. Figure 7 below shows the six most common activities that are carried out in circular economy hubs:

Figure 7: Typical Activities of Circular Economy Hubs

Scale and Priorities

Most of the circular economy hubs are single buildings located within a city or area.

There are also examples of circular economy hubs operating at regional and national levels. The focus of these hubs, and the issues prioritised, vary depending on their level of operation.

Figure 8 opposite shows the priorities addressed across each of the four levels of scale:

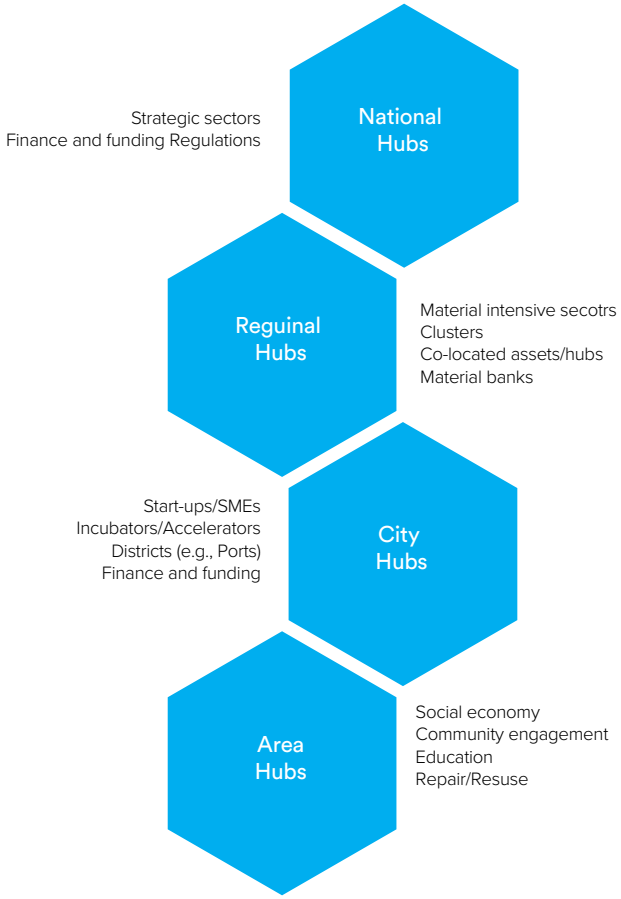


Figure 8: Priorities Addressed at Various Levels of Circular Economy Hubs

Operating Models

There is also variation in the types of operating models that circular economy hubs adopt. The two most common are:

- **Dominant organisation** - in these circular economy hubs, one organisation, such as a local Government or a single anchor institution, dominates the governance. The dominant organisation typically owns or has control over the building and determines the activities, infrastructure, and strategy.
- **Multi-stakeholder** - in this operation model, multiple stakeholders have a role on a board or advisory committee. These stakeholders are given authority to make decisions on the activities, infrastructure, and on the strategy of the circular economy hub.

Governance Models

There is no single governance model for circular economy hubs, but there are some common characteristics.

Depending on the governance model, there are different levels of partnership with City authorities or National Government. Some of the typical governance models adopted by circular economy hubs are:

- **Independent Organisations** - these circular economy hubs are often legally independent organisations such as a not-for-profit company limited by guarantee, association, or local development company. They usually address gaps in the circular economy ecosystem (e.g., social enterprise support, research) or innovation infrastructure (e.g., material banks, and other R&D facilities).
- **Formal Alliances** - these circular economy hubs can be city-led or alliances among institutional, Government, and not-for-profit organisations. They typically have a formal agreement that outlines terms of reference, roles, and functions. Alliances forged with Government often have some form of built-in capital.
- **Informal Partnerships** - in this governance model, the circular economy hubs were set up as informal partnerships with organisations working together to achieve a shared vision without a formal structure.

CIRCULAR ECONOMY HUBS: 6 CASE STUDIES

This section provides an overview of six circular economy hubs across different countries. The hubs are operating successfully through different approaches and in different contexts, operational models, and goals. All the hubs have transformed previously used spaces into centres for circular economy innovation, promotion, and awareness. A key selection criterion for each circular economy hub is that it contributes significantly to the development of the circular economy in its city, region, and country.

The six Case Studies are:

- Blue City Circular Economy Hub (Rotterdam, The Netherlands)
- The Plant Circular Economy Hub (Chicago, USA)
- Amsterdam Port Prodock Circular Economy Hub (Amsterdam, The Netherlands)
- Basque Circular Economy Hub (Basque Country, Spain)
- Nokia Island/Tehdassaari Circular Economy Hub (Tehdassaari, Finland)
- RE:Source strategic innovation program (Sweden)

BLUE CITY CIRCULAR ECONOMY HUB,
ROTTERDAM, THE NETHERLANDS

About

Established in 2015, The Blue City Hub was a vacant water park that has become transformed into a circular economy hub for Rotterdam city and surrounding regions. This hub is an exemplar of a circular economy hub. The transformation from swimming pool to circular economy hub itself was 90% circular. Today, it is home to 55 entrepreneurs.

Activities

The Blue City Hub is primarily focused on raising awareness on the importance of the circular economy and educating and training people in circular approaches and practices. In doing so, the hub aims to build circular economy capacity in Rotterdam through providing supports for local businesses and social enterprises and engaging with local communities to promote circularity.

Focus areas

- Waste & material circulation.
- Food.
- Impacting daily life.
- Nature economy.
- Consumer goods.
- Trade/sharing.

Finance

- Funded by private capital investment.
- Also supported by 10% Municipal funding
- This hub is also a self-sustaining operation with revenue being fed back into the hub.

Size

- The building is approximately 1300m^2.

BASQUE CIRCULAR ECONOMY HUB,
BASQUE COUNTRY, SPAIN

About

Established in 2021, the Basque Circular Economy Hub offers advanced circular economy services in the Basque region. By 2024, it aims to train 1,200 professionals about the circular economy and promote the use of the hub for 1,500 companies, as well as assisting them in preparing a strategy for their circular economy roadmap.

Activities

The hub's main services include education and advanced training, trend analysis and encouraging the growth of knowledge and experience in the field of circular economy. One of the main aspects of the hub is the circular economy observatory which aims to investigate the potential for new business opportunities and support entrepreneurship in sectors that are contributing to the circular economy.

Focus areas

- Waste & material circulation.
- Construction.
- Food.
- Mobility & logistics.
- Consumer goods.
- Trade/sharing.
- Technologies.

Finance

- Funding for this project was managed by the public company Ihobe.
- The development was supported by public-private collaboration.

Size

The Basque Circular Hub has 2 buildings:

- Bilbao: Space in the AUZO Factory Matiko.
- Vitoria-Gasteiz: 238m^2.

AMSTERDAM PORT PRODOCK CIRCULAR ECONOMY HUB, AMSTERDAM, THE NETHERLANDS

About

Founded in 2016, Prodock is a circular economy hub located within Amsterdam Port. The hub's aim is to encourage circular innovation in the port itself, the North Sea canal area, and the wider Amsterdam regions. Prodock acts as a physical innovation space, but also supports a community and movement towards circularity alongside a launch platform for emerging businesses and technologies that support the Circular Economy.

Activities

The hub provides a facility that supports new businesses in creating, scaling, and testing their ideas and products. It also hosts events, talks, and workshops in their multifunctional events and meeting spaces that are open to the wider public. The hub is committed to building a network amongst the local community, local businesses, local innovators, and businesses.

Focus areas

- Impacting daily life.
- Mobility & logistics.
- Consumer goods.
- Trade/sharing.
- Technologies.

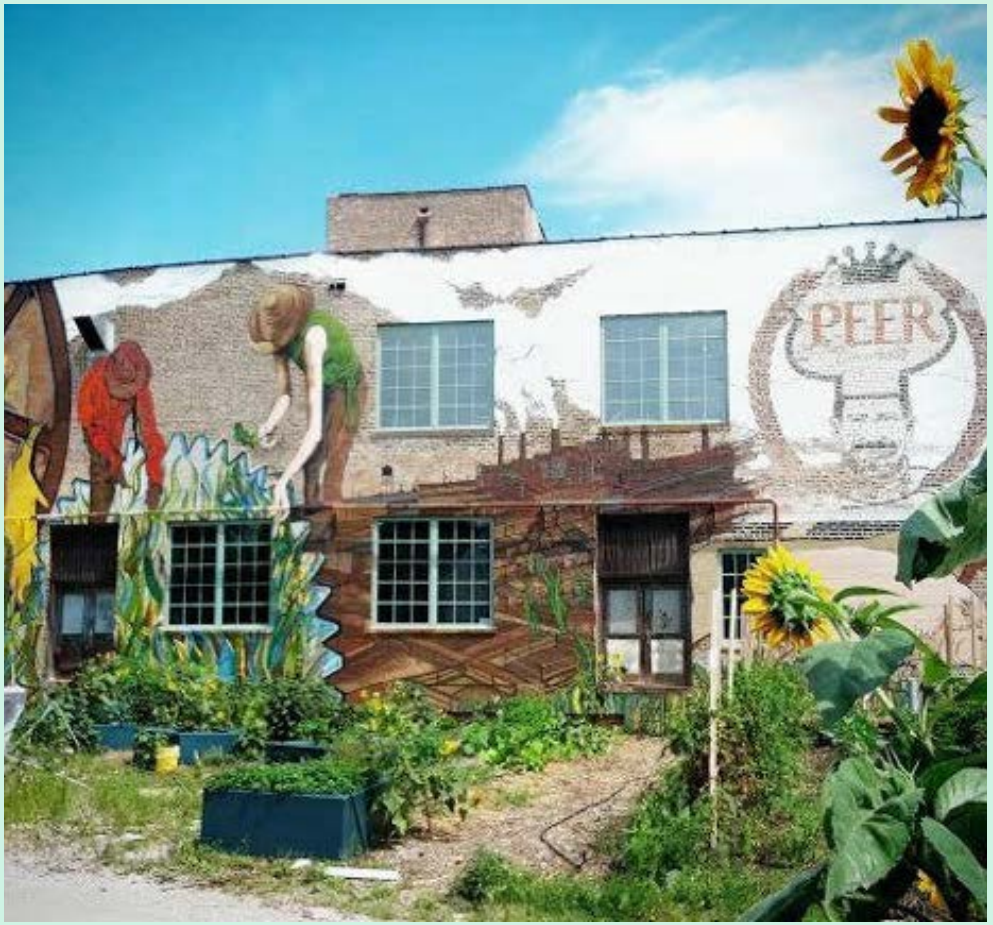
Finance

- The hub is funded by Amsterdam port.
- It is a for-profit model.

Size

- The building and industrial space is approximately 4000m^2.

THE PLANT CIRCULAR ECONOMY HUB,
CHICAGO, USA



About

Founded in 2010, The Plant is a former meatpacking facility that has been transformed into a circular economy hub which is a food production facility and focuses on research. The hub is home to a community of small food businesses that collaborate to make The Plant a 'No Waste' food factory.

Activities

The Plant aims to raise awareness of circular practices through the example of the businesses operating within the building. The Plant also offers tours to local communities and universities, and opens its doors to researchers, providing education on their model of circularity. Their model is based on collaboration, with careful selection of businesses within the hub so that each businesses production can feed into another, creating a circular ecosystem.

Focus areas

- Waste & material circulation.
- Food.
- Impacting daily life.
- Nature Economy.
- Consumer goods.
- Trade/sharing.
- Technologies.
- Energy & utilities.

Finance

- The Plant received a $1.5 million grant from the Illinois Department of Commerce to initially fund the project.
- The hub is operated by the company Bubbly Dynamics and is mostly self-financing.

Size

- The building is approximately 10,000m^2.

TEHDASSAARI CIRCULAR ECONOMY HUB, FINLAND

About

Established in 2020 through co-creation, Tehdassaari Innovation District, more commonly known as Nokia Island, is a circular economy hub developed on the site of Nokia's former manufacturing headquarters. This district has been converted to an innovation hub promoting circularity and aims to combine well-being, sustainable and circular solutions across the areas of flexibility, disassembly, energy, and water.

Activities

The hub aims to be an exemplar of Circular Economy principles. It provides education and training through workshops, keynote speakers, process and workshop facilitation, trend analysis and reports, and research. The overall aim is to raise awareness and build capacity for the development of circular practices.

Focus areas

- Waste & material Circulation.
- Construction.
- Food.
- Impacting daily life.
- Energy & utilities.
- Mobility & logistics.
- Nature economy.
- Consumer goods.
- Trade/sharing.
- Technologies.

Finance

- This hub was commissioned and privately funded by Cierco Circular Construction consultants.
- The Cierco consultants now also use the district as their head office as well as its role as a Circular Economy Hub.

Size

- The district is approximately 28,000m^2.

RE:SOURCE STRATEGIC INNOVATION PROGRAMME, SWEDEN

About

RE:Source is a Strategic Innovation Programme that finances projects within the sustainable material field. The program started in 2016 and has financed and supported more than 250 projects. RE:Source is financed by the Swedish Energy Agency, Vinnova and Formas and is led by a program office and a board.

Activities

RE:Source finances projects that develop financially viable solutions and contribute to more sustainable resource use and a more circular economy. The resources are mainly physical resources such as materials, components, products, buildings, infrastructure, food and more.

Focus areas

- Business models.
- Built environment .
- Digital.
- Electronics.
- Energy.
- Food.
- Logistics Plastics.
- Textile.
- Procurement.

Finance

- RE:Source is one of seventeen Strategic Innovation Programmes (SIP) funded by the Swedish Energy Agency, Formas, and Vinnova. The assignment to the three authorities came from the Government's research and innovation bill.

Size

- 7 staff - programme manager, innovation manager, implementation manager and communicators.

LESSONS LEARNED SUMMARY

A comprehensive review of innovation hubs, circular economy strategies and existing circular economy hubs including case studies was undertaken to gain insights and identify key learnings.

Innovation Hubs

- Innovation hubs are a well-established model with a similar focus and objectives to circular economy hubs. The key infrastructure elements and success factors for innovation hubs therefore are a useful reference point for developing Connected Circular Economy Hubs. Amongst other elements, key success factors would include proactive programmes within hubs, and proactive engagement with the surrounding circular economy innovation ecosystem.

Circular Economy Strategies

- The review shows that circular economy strategies have a strong focus on realising economic opportunities and achieving climate targets. It is therefore important that the potential to deliver on both economic and climate goals is factored into the development of circular economy hubs.
- The strategies incorporated a wide range of focus areas but the three most common were waste, construction and food. This perhaps reflects that they are the areas with high levels of opportunity for circularity and high levels of impact.

Circular Economy Hubs

- The review of hubs also demonstrated the importance of having a physical space where stakeholders can come together to collaborate with each other in relation to the circular economy.
- The emphasis on economic opportunities and climate action was also evident in the stated purpose of the circular economy hubs reviewed. The key hub programmes for delivering on these objectives focused on clustering and collaboration, capacity building and the provision of physical infrastructure.
- Successful hub models shared a clear governance structure and a sustainable funding model, indicating that these will be critical success factors for Connected Circular Economy Hubs in Belfast and Dublin, enabling access to finance and market, running innovation pilots and advocacy.

Hub Case Studies

- The case studies reviewed had similarities in terms of having a clear focus and offering a variety of Circular Economy services and supports. It is important to note however that each one has a unique identity, reflecting their building type and scale, and the city or region in which they are founded.
- Circular Economy Hubs utilise a variety of revenue streams. This includes revenue from commercial activities such as office space rental, retail and venue hire; income from particpation in research programmes and from other commissioned activities such as hosting and delivering programes on behalf of other organsiations.

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PRELIMINARY DEMAND ANALYSIS

7. PRELIMINARY DEMAND ANALYSIS

This section provides an outline of the current and future demand for the Connected Circular Economy Hubs in Belfast and Dublin. The evidence presented is based on quantitative and qualitative data analysis, along with inputs from the Expert Advisory Group and stakeholder engagement.

EVIDENCE OF DEMAND IN NORTHERN IRELAND AND IRELAND

Data from research conducted relating to the business communities in Ireland and Northern Ireland highlights the growing demand for capacity building for the transition to a Circular Economy. The key surveys identifying this demand are summarised below:

The Draft Circular Economy Strategy for Northern Ireland

(Department for the Economy)

This report identifies a number of barriers which points towards demand for targeted circular economy hubs, including:

- The current approach to capital investment is to build new.
- Lack of CE awareness and understanding of the opportunities CE can present for businesses.
- Connections are lost between the demand for raw materials and the impact it has on climate change, biodiversity loss and inequality.
- Inadequate provision of networks to foster collaboration across sectors.
- Lack of knowledge and appropriate skills enable circularity across industries.

These barriers could be tackled in an integrated way through Connected Circular Economy Hubs.

The Case for a Circular Economy Strategy for Northern Ireland

(Commissioned by Business in The Community Northern Ireland and Waste & Resources Action Programme Northern Ireland 2017)

In this report prepared by Eunomia Research & Consulting Ltd, it was estimated that a Circular Economy in Northern Ireland has the potential to create 13,000 jobs, reducing unemployment by 1.5 percentage points.The report outlined several recommendations to help support businesses to embrace the Circular Economy. Connected Circular Economy

Hubs would help to implement these recommendations:

- Provide support for businesses to engage in circular economy business models, disseminating research findings and assisting circular economy start-ups.
- Provide financial and technical support on trials and R&D demonstrating the business case for circular economy practices.
- Work with the design sector (e.g., by engaging with the Northern Ireland Design Alliance) to encourage a focus on designing out residual waste wherever possible.

Northern Ireland Responsible Business Tracker

(Business in the Community Northern Ireland (BITC), 2022)

The 2022 Northern Ireland Responsible Business Tracker, found that 38% of companies had already made capital investment in circular economy with a further 17% planning to do so in the future. Of those planning future investment, the vast majority are considering doing this regardless of grant funding. The report also found that out of seven Responsible Business Areas, Circular Economy ranked 6th in terms of its importance to business. Before nature stewardship but after health, diversity, climate action, inclusive employment, and education.

Is Irish business Getting Ready for the Circular Economy?

(Undertaken by Irish Business & Employers Confederation (IBEC) in association with the Environmental Protection Agency (EPA) 2018)

In 2018, IBEC surveyed 217 member companies, representing 81,534 employees, across manufacturing, service, and distribution businesses. The survey asked about aspects of business planning for the circular economy, initiatives currently in place, attitudes to the circular economy across businesses and the perceptions of Irish business around the circular economy.

Across all respondents, 51% understand what a Circular Economy is, and this rises to 78% among companies with over 250 employees.

49% viewed the Circular Economy as a business opportunity in the longterm and increasingly important to company operations. For larger businesses with over 500 employees, 89% viewed the Circular Economy as an opportunity. Challenges remain, however, in relation to SMEs and micro-enterprises, which represent most Irish businesses.

It is also striking that at the time of the survey, barely half of respondents understood what was meant by the Circular Economy.

In alignment with the Northern Ireland study, the IBEC survey recommended an increase in education and support, particularly for smaller companies, on the opportunities that may arise as Europe transitions to a more Circular Economy. They also identified the need to support businesses in accessing financial support, training and advice from state agencies, research institutions and supply chain partners.

Circular Economy Training programme for SMEs

Several Circular Economy focussed training programmes have been set up in recent years which indicates a demand for circular training among businesses.

MODOS is a Circular Economy Training programme for SMEs operating in Ireland and funded by the EPA. Set up in 2020, it is an initiative of the Regional Waste Management Planning Office and Dublin City Council Economic Development Office. As of March 2022, the programme is delivered in Dublin City Council and Dún Laoghaire-Rathdown County Council. The programme is delivered through training events, webinars, mentoring, and Circular Innovation awards.

After two years of operation, more than 80 businesses have participated in the training course. This is a new programme with a

modest budget but provides an indication of the demand for Circular Economy supports from smaller businesses in Dublin.

Other enterprise training programmes that are building the skills base for Circular Economy include:

Retro-fit Skills Academy – this was developed by the employability and skills team in Belfast City Council with input from the construction sector.

- **SOLAS Skills to Advance – Green Skills** – this is a national initiative providing a set of accredited modules to support employers, employees, and those in further education training. A Circular Economy module is being developed
- **SkillsNet** – SkillsNet provides sustainability training to the workforce to support the transition to a low carbon and Circular Economy.
- **Circular Economy Skills Initiative** - a project under CIRCULÉIRE's Innovation Fund developed an electrical repair course to train a new generation of repair technicians to prevent electrical and electronic equipment going to waste.

PROCUREMENT DRIVEN DEMAND

One of the areas playing a key role in driving demand for circular goods and services in Ireland and Northern Ireland is Green Public Procurement. Northern Ireland's public procurement budget is £3 billion annually. In Ireland public bodies (excluding utilities) spend an estimated €18.5 billion a year on goods.

Within its Social Value Procurement Policy, Belfast City Council requires all suppliers to tenders over £30,000 have 'Environmental Policies and Procedures (supporting the Circular Economy/procurement)'.

Across the Northern Ireland Executive, there are also a number of green procurement initiatives in progress:

- The Draft Green Growth Strategy commits to green procurement within its 10 Green Growth Promises.
- The Draft Circular Economy Strategy includes a proposal in relation to public procurement and the opportunity it creates to purchase in a more responsible manner.
- The Department of Finance is also progressing green procurement guidance for its buyers.

The Government of Ireland's annual public sector purchasing accounts for 10% to 12% of Ireland's GDP and is a significant driver of economic activity and demand.

The Government of Ireland's Circular Economy and Miscellaneous Provisions Act 2022 requires that the Circular Economy Strategy promotes the use of criteria relating to the circular economy in public procurement. After the next Circular Economy Strategy is adopted in 2024, detailed guidance on the application of Green Public Procurement criteria relating to the Circular Economy will be published by the Department of the Environment, Climate and Communications (DECC).

In terms of procurement by commercial semi-states bodies, the Climate Action Framework for the Commercial Semi-State Sector was approved by Government in July 2022. This consists of five commitments, one of which relates to the circular economy.

In their procurement of goods and services, commercial semi-state bodies are required to demonstrate leadership by example in Ireland's transition to a Circular Economy, having regard to the proposals and initiatives of DECC, the OGP and the EPA; the Whole of Government Circular Economy Strategy; the targets relating to

waste reduction set out in the CAP 2021; and the statutory requirements set out in the Circular Economy and Miscellaneous Provisions Act 2022.

The establishment of minimum mandatory Green Public Procurement criteria and targets in sectoral legislation as outlined above will drive demand for circular products and services from the market. Based on the BITC/IBEC surveys referenced above, businesses are not ready for these changes, which will impact on their viability if they are part of supply chains impacted directly or indirectly by these forthcoming changes in public procurement.

VALUE CHAIN DRIVEN DEMAND

Connected Circular Economy Hubs can play a role in supporting SMEs that may be vulnerable to regulatory changes driving the Circular Economy transition. This can help ensure a smooth transition along the entire value chain.

From 2025 almost 50,000 companies across the EU will be required to comply with the Corporate Sustainability Reporting Directive and Environmental Sustainability Reporting Standard. It will be mandatory for companies to report on their double materiality risks, including risks associated with the Circular Economy. Some of the key issues these companies will need to report on include:

- **Materiality** – to determine which parts of a company's value chain are important to report on.
- **Policies** - Circular Economy policies the company has put in place to mitigate risks.
- **Actions and resources** - circular economy actions and resources the company has committed to.
- **Targets** - circular economy targets the company has established.
- **Resource inflows and outflows** – material flows mapping using standardized metrics (such as GRI standards or Circulytics).
- **Potential financial effects** - assessing potential future effects of the company's current performance on circularity.
- While non-listed SMEs have no immediate reporting requirements, they may need to provide information to large companies if they are part of the value chain.

INVESTOR DRIVEN DEMAND

The EU Taxonomy Directive means that environmental, social and governance risks, profiles and performance will influence loan conditions. Connected Circular Economy Hubs can support SMEs to continue raising finance in this changing context.

SMEs rely on banks for 70% of their external funding and the emerging regulatory landscape is likely to shape lending behaviours (Kirschenmann, K., 2019). The EU's Sustainable Finance Taxonomy regulations aim to make the private sector account for sustainability related non-financial factors when making financing and investment decisions.

The Taxonomy associated with these regulations is a shared classification system for defining environmentally sustainable investments, including the transition to a Circular Economy.

All financial sector operators must disclose how and to what extent their economic activity includes, promotes, or finances sustainable projects according to the EU taxonomy criteria.

There are four categories within the Taxonomy to define substantial contribution to the Circular Economy (see Figure 9, below). They are:

- **Circular design and production** - design and produce products and materials with the aim of retaining longterm value and reducing waste.

Figure 9: Circular Economy Value Chain

Design & Production

Designing and producing products, buildings and materials with the aim of durability (long-term value), reducing waste; reducing material inputs or replacing products with services.

Circular use

Extending the life of products and buildings e.g. by offering services for repair, remanufacture, refurbish, ;

Value recovery

Capturing value from products and materials aftyer the use phase e.g. Upcycling, Downcycling, Biorefining

Circular support

e.g. enabling digital tools and data, education and awareness-raising programmes, and advisory services to support circular economy strategies and business models

Promote dematerialisation by making products redundant or replacing them with a radically different product or service

- **Circular use** - extend life and optimise use of products and assets during the use phase, with the aim of retaining resource value and reducing waste to help improve usage and supporting service

- **Circular value recovery** - capture value from products and materials in the after-use phase

- **Circular support** - activities that contribute to the Circular Economy objective by enabling other circular activities to take place, thus reducing pressure on the environment.

The UK Government has also committed to developing a comparable Green Finance Taxonomy. The cross-boundary nature of a connected circular economy means that it will be necessary for the Connected Circular Economy Hub to identify an appropriate level of harmonisation between both taxonomies.

FUTURE DEMAND

In addition to demand as currently understood, several key future demand drivers for Circular Economy were identified:

1. Future policy resulting in both direct investment and new regulation will provide opportunities and challenges for businesses. However, businesses may struggle to embrace the opportunities and overcome the challenges if they are not supported to do so. This will create future demand for Circular Economy support services.
2. Security of supply chains for critical raw materials and price volatility for commodity goods and energy will also have an impact on future demand. As an export and import dependent small island economy, these strategic risks need to be addressed to safeguard wider industrial and economic growth on an all-island basis.
3. As stated earlier, the population across Ireland and Northern Ireland is expected to grow by more than one million by 2050. Much of the population growth will be in the cities of Belfast and Dublin. This will lead to significant growth in sectors such as construction and bioeconomy/food, which are key sectors for the Circular Economy.
4. If the ambitious Circular Economy targets set by Ireland and Northern Ireland are to be achieved, future demand for guidance and support in relation to the Circular Economy will significantly exceed current demand and current availability of such resources.

PRELIMINARY DEMAND ANALYSIS SUMMATION

There are number of factors driving demand for dedicated and targeted intervention to enable the transition to a Circular Economy in Belfast and Dublin:

- **Business Support Demand** – evidence from business representative groups and business supports programmes in Ireland and Northern Ireland highlight the growing demand among businesses for capacity building on the transition to a Circular Economy. Alongside this, a dedicated, easily identifiable, and well-marketed solution is also required to address information deficits among SMEs and micro-enterprises in relation to the Circular Economy and the challenges and opportunities it will bring.
- **Procurement Driven Demand** – the establishment of minimum mandatory Green Public Procurement criteria and targets in sectoral legislation will drive demand for circular products and services from the market.
- **Value Chain Driven Demand** – Connected Circular Economy Hubs can play a role in supporting SMEs that may be vulnerable to regulatory changes driving the Circular Economy transition. This will help ensure a smooth transition along the entire value chain.
- **Investor Driven Demand** – implementation of the EU Taxonomy Directive, and the forthcoming UK Green Finance Taxonomy means that environmental, social and governance risks, profiles and performance will influence loan conditions for businesses. Connected Circular Economy Hubs can support SMEs to continue raising finance in this changing context.
- **Future Demand** – the key drivers of future demand are future policy, security of supply chains, population growth and meeting Circular Economy targets.

IDENTIFICATION OF OPTIONS

8. IDENTIFICATION OF OPTIONS

Belfast City Council and Dublin City Council recognise that targeted solutions are required to achieve the transition to a circular economy at the pace and scale required. Both City Councils embarked on this project with an openness regarding the sectoral focus, types of capital solution, locations or scale of facilities.

A longlist of options has been developed and assessed in response to the rationale, case for change and objectives identified for Connected Circular Economy Hubs in Belfast and Dublin.

These options have been derived through research and consultation. The consultation included two targeted workshops in Belfast and Dublin, which were attended by over 50 stakeholders with expertise in Circular Economy, climate action and enterprise development.

The workshops paid particular attention to the existing Circular Economy ecosystems in Belfast and Dublin and, from this context, considered the needs and opportunities that should be addressed across each of four key elements of the Circular Economy: Design & Production; Circular Use; Value Recovery; and Circular Supports.

These workshops were supported by engagement with the Connected Circular Economy Steering Committee from Belfast City Council and Dublin City Council.

Additional analysis and guidance was also provided by an Expert Advisory Group established for this project.

The longlist of options was further informed by:

- Analysis of established circular economy hubs and regions.
- Policy and strategy analysis.
- Preliminary demand analysis, considering economic strengths, challenges and key demand drivers for Ireland and Northern Ireland.

Given the pace and scale of transformation required (for both the economy and the climate) and the range of potential approaches which could deliver the outcomes and impacts required, the longlist is ambitious and broad in its reach.

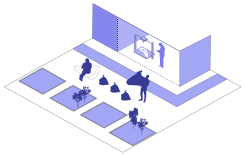
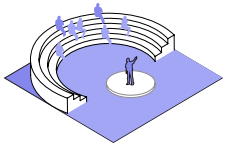
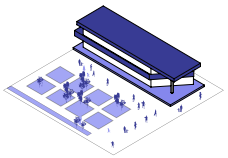
LONGLIST OF OPTIONS

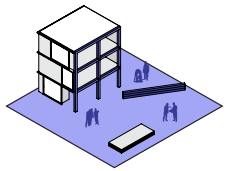
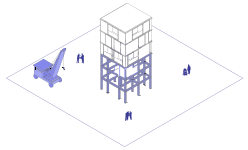
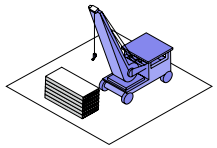
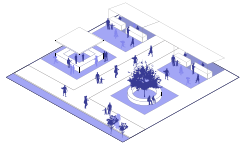
There are nine options, in total. One of these options is a 'Do Nothing' option, which offers a counterfactual position against which other options can be assessed.

The remaining eight options include a 'Do Minimum' option. Within this SAR/ SOC, these eight options are initially focused on shared approaches in Belfast and Dublin. However, each has potential for differentiation and complementarity appropriate to the two lead cities.

The eight options have varying potential to deliver against the stated objectives for the project, which is subsequently explored in the Multi-Criteria Analysis.

The table opposite sets out the initial longlist of options, followed by a summary description and Strengths, Weaknesses, Opportunities and Threats (SWOT) analysis of each option.

		Name	Description	Explanation
1		BAU	Business as Usual. Do nothing.	This option sees a continuation of existing delivery of limited supports and a slower than required transition to a circular economy in Belfast and Dublin.
2		Connect	'Do Minimum' option with coordination/ resources in both cities.	This option focuses on the coordination and evolution of existing circular economy supports in and between Belfast and Dublin.
3		SocialCircle	Investment and Accelerator programme for circular social innovation.	An investment platform and accelerator programme for circular social innovation in Belfast and Dublin.
4		Circulate	Circular support hub for early-stage entrepreneurs.	A circular support hub for entrepreneurs located in Belfast and Dublin.

5		**Plate**	Incubator and demonstration programme in food and hospitality sector.	A specialised incubator and demonstrator programme supporting circular food and hospitality businesses.
6		**HomeLab**	Longterm demonstrator programme in the social housing sector.	A longterm demonstrator programme focused on scaling up circularity in the built environment and housing sector in Belfast and Dublin.
7		**UrbanFlow**	Cross border resource roundabout and digital platform.	A cross border resource roundabout working as an online library and database of information on materials and products.
8		**WarehouseFlow**	Circular material banks and depots for the building sector.	Product/materials separation centres in Belfast and Dublin. It will work as a material bank and depot for the building sector.
9		**RegenPorts**	Circular innovation hubs in Belfast Harbour and Dublin ports.	Innovation hubs driving innovation in the circular flow of primary and secondary raw materials in Belfast Harbour and Dublin Port, and potentially along the Dublin-Belfast Economic Corridor.

Option 1: BAU

Option 1: BAU	Scope	Service Delivery	Rationale
Do Nothing / Business-as-Usual	**The Business as Usual (BAU) option maintains the status quo in terms of both provision and the pace of change enabled. It does not extend levels of service, reach or the types of supports provided.**	The service offering would continue its current trajectory, with the Rediscovery Centre providing a focus for research, policy, advocacy, education, demonstration, and social enterprise in Ballymun. In addition to this, Dublin has several smaller scale initiatives in training, research and supports for businesses and social enterprises, while Belfast has a range of initiatives and pilots with a strong focus on circular use.	The rationale for this option is to avoid investment, and the risks associated with such investment and to allow the market and existing services to deliver on the transition to a circular economy in Belfast and Dublin.

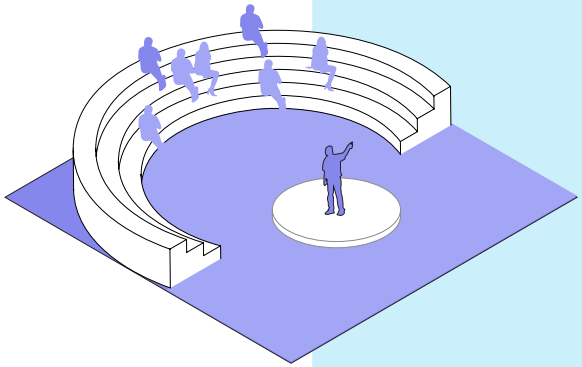
Strengths	Weaknesses	Opportunities	Threats
• Does not require investment of time, capital, or operating resources.	• Continuation of current fragmented approach to delivery of circular services and supports in each city. • Does not contribute to addressing the climate challenge or meeting Net-Zero targets. • Does not provide a dedicated focus to addressing structural economic challenges for the two cities to transition to Circular Economic models.	• Opportunity to become a later adopter of solutions and technologies developed by other cities to transition to a circular economy.	• Supply chain vulnerabilities remain unaddressed. • Belfast and Dublin are less competitive where circularity of supply chains is a factor in business location/ growth. • Waste management challenge and costs escalate in line with new policy/ regulatory frameworks. • Belfast and Dublin identified as laggards in the development of circular economies.

Option 2: Connect

Option 2: Connect	Scope	Service Delivery	Rationale
	Connect focuses on the coordination and evolution of existing circular economy supports in and between Belfast and Dublin.	The Connect hubs will enable better coordination and promotion of existing enterprise support services and networks, with potential to extend the reach of existing supports. This option may also allow for showcasing of emerging Circular Economy research that enterprises can benefit from and for future development of joint initiatives between Belfast and Dublin.	A range of circular economy supports are being developed by both cities and the wider enterprise support ecosystem. Several knowledge and enterprise hubs also already exist, particularly in universities. However these activities are fragmented. There is a need to co-ordinate existing supports to strengthen the transition to a circular economy.

Strengths	Weaknesses	Opportunities	Threats
• Better coordination of existing services in Belfast and Dublin. • Creates partnership. • Supports a range of stakeholders. • Operates across multiple sectors. • Minimal funding required.	• Does not ambitiously target the transition to a circular economy. • Unlikely to strengthen the readiness of enterprises at the pace and scale required. • Limited impact on achieving any objectives in a targeted way without further focus.	• Become a nexus for circular economy stakeholders in both cities. • Connect existing entrepreneurship, innovation, and social enterprise platforms. • Expand into more ambitious programme activities as more funding became available in the future.	• Could lose momentum without ongoing development and/or a targeted focus. • Difficulty in establishing and maintaining partnerships with limited resources. • Core resources could be withdrawn if it is perceived to displace other activities.

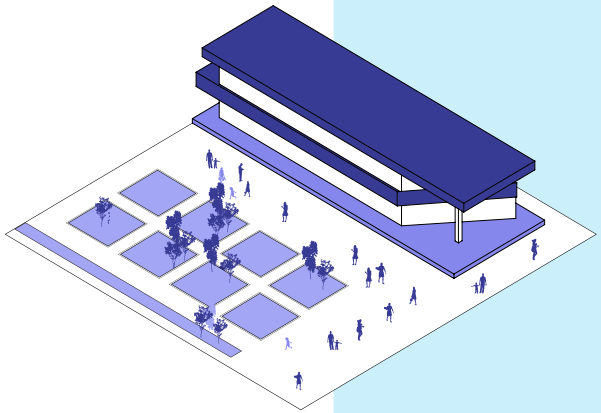
Option 3: SocialCircle



Option 3: Social Circle	Scope	Service Delivery	Rationale
	SocialCircle is an investment platform and accelerator programme for circular social innovation in Belfast and Dublin. It seeks to leverage the potential of existing entrepreneurship, social enterprises, and communities	SocialCircle hubs will provide city-centre collaborative workspaces, low-cost production facilities and events that connects communities, businesses, and social enterprises with the potential to act as social innovators. These social innovators are supported to develop products, services or technologies that respond to circular economy challenges.	Both Belfast and Dublin have active social economy sectors working on circular economy initiatives. Stakeholder engagement identified the need for these to be scaled up across both cities, with the potential for a broad reach across communities, while addressing a range of city level barriers to the circular economy.

Strengths	Weaknesses	Opportunities	Threats
• Broad-reaching support programme to target city and community level circular economy challenges . • Existing social economy circular enterprises in both cities to build on. • Tangible benefits for consumers from SocialCircle activities. • Straightforward building with lower-cost outlay on technical facilities.	• Lack of current awareness among mainstream consumers about the benefits of circular solutions. • Does not support the transition required within existing enterprise sector, and the targeting of new businesses is indirect. • May not address circular use rate objective or targets at scale.	• Addressing barriers to the circular economy at a city level e.g., innovations in valorising waste flows, or micro- level industrial symbiosis. • Increasing consumer awareness for circular products. • Showcasing Belfast and Dublin as exemplars in collaborative approaches to circular social innovation.	• Current fragmented operating environment for delivery of circular services and social economy supports will pose challenges. • Changing regulatory environment may be a deterrent to longer gestation of social innovations. • Potential low level of capacity among social innovators and communities.

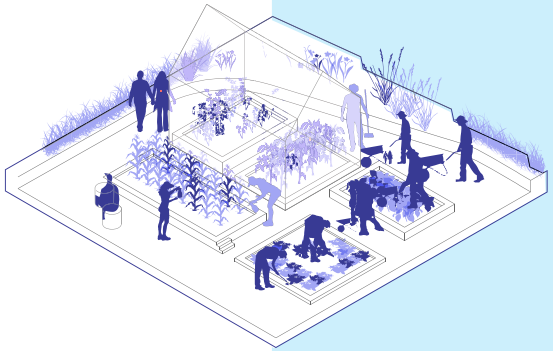
Option 4: Circulate



Option 4: Circulate	Scope	Service Delivery	Rationale
	Circulate is a circular support hub for entrepreneurs located in Belfast and Dublin who are seeking to invest through existing entrepreneurship and innovation hubs.	Circulate hubs provide incubation programmes for start-ups and early-stage companies, pre-competitive procurement, structured finance, and R&D/ prototyping labs. Once established as a successful programme, the service offering can be expanded to support the transition of existing (linear economy) businesses to circular economy models through intrapreneurship programmes.	Both Belfast and Dublin have thriving innovation hubs and venture capital funding portfolios. There is a growing interest in pivoting these towards supporting sustainable and circular enterprises. There is an opportunity to leverage these existing hubs and their ecosystems to enhance circular enterprise supports in both cities

Strengths	Weaknesses	Opportunities	Threats
• Supports early-stage circular entrepreneurship and R&D in an agile way. • Leverages existing enterprise and circular economy networks in both cities inclusing new Irish Tech Hub Network. • Initiative scaled through existing entities, reducing initial capital and administrative costs. • Supports delivery of Dublin Regional Enterprise Plan.	• Initial focus on new enterprises may slow impact on existing enterprises. • Existing innovation hubs, as innovators / early adopters, likely to transition towards Circular Economy within existing funding/ frameworks. • Less targeted in development of a connected circular economy between Belfast and Dublin.	• Able to draw in multiple forms of investment: venture capital, philanthropy, EU, European Investment Fund. • Can scale to support the transition of existing (linear economy) businesses to circular economy models. • Potential to develop shared equity model for ongoing programme funding. • Opportunities for shared learning / complementarity between cities.	• Challenges in attracting and securing the right partners. • Potential limitations on existing physical space. • Challenge/risk in sustaining co-funding as demand grows.

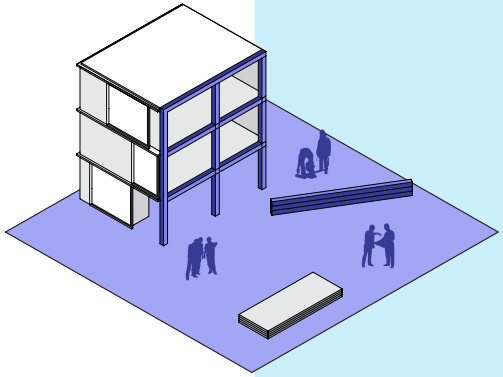
Option 5:
Plate



Option 5: Plate	Scope	Service Delivery	Rationale
	Plate is an incubator programme to support the growth of circular food and hospitality businesses in and between Belfast and Dublin. In time, Plate will provide a comprehensive demonstration programme to support transition of the wider food/hospitality sector.	Plate hubs will provide R&D labs for processing and ingredient innovation, circular packaging, affordable commercial kitchens and retail kiosk space, service & business model innovation, city wide collection infrastructure, connections to market channels and dedicated waste processing (anaerobic digestion, scaled composting).	The food and hospitality sectors were identified as a potential priority sector because of their importance to the Irish and Northern Irish economy, the significant waste volumes and greenhouse gas emissions generated, multiple international examples of hubs demonstrating the readiness of the food and hospitality as circular sectors, and the potential co-benefits for other sectors such as tourism.

Strengths	Weaknesses	Opportunities	Threats
• Well-established models in circular food / hospitality from which to learn. • Well-established food and hospitality economy in both Belfast and Dublin. • Allows for practical demonstration of a closed loop example. • Supports circular economy in a consumer sector with potential for wide impact.	• Targeted sectoral focus will limit support to other areas where intervention may be warranted (e.g. construction, manufacturing). Delivering aspects of this project requires technical expertise. • Additional capital investment needed for specialist fit out of the buildings.	• To scale demonstration, at pace, across existing businesses within the food and hospitality sector. • Opportunity to showcase the project internationally and highlight best-practice within the food and drink sector in Ireland and Northern Ireland . • Early wins and higher consumer-facing profile likely to create opportunities for demonstration and shared learnings across other sectors.	• Brexit related challenges of movement of goods between jurisdictions. • Economic pressures on food and hospitality sector may affect their willingness to engage with the circular economy. • Changing regulatory environment.

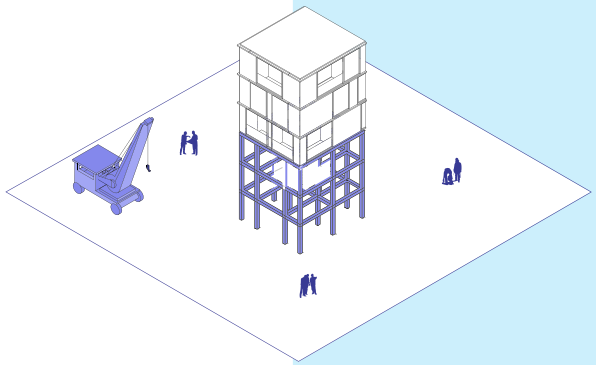
Option 6: HomeLab



Option 6: HomeLab	Scope	Service Delivery	Rationale
	HomeLab focuses on circularity in the built environment and housing sectors in Belfast and Dublin. It will develop 'enabling infrastructure' in both cities, and leverage existing capital investment plans to demonstrate and scale circularity in construction.	HomeLab will integrate with existing capital programmes, prioritising renovation over demolition. It will test and scale technical and regulatory innovations and create enabling infrastructures such as material bank initiatives (space/ warehousing/ digital platform) to circular depots (circular refurbishment and maintenance).	Both Belfast and Dublin have population growth forecasts which will result in significant housing development. Both cities need to deliver on climate policy targets. Both cities also want to support the resilience and competitiveness of their economies. HomeLab provides an integrated programme to deliver against these drivers. It is anticipated that adopting circular models will also be key to unlocking capital funding in the future.

Strengths	Weaknesses	Opportunities	Threats
• Primary levers within public sector control, including significant capital investment. • Strong alignment to climate policy objectives. • Significant range of international research models. • Highly visible initiative serving a wide range of stakeholder interests, with strong demonstrator potential for the wider construction sector.	• Timing may not suit housing/capital programmes already underway and budgeted for. • Complexity around financing.	• Potential for large scale impact in terms of circularity. • Potential to enable/ catalyse delivery of wider City Council agendas e.g. urban regeneration and public realm investment. • Leveraging new and emerging platforms, technologies, and programmes e.g. Build360, City Deals, Digital Twin, Higher Education Research Centres. • Enhancing supply chain resilience for construction.	• Regulatory barriers e.g. existing building regulations. • Possible delays to housing delivery as technical or financial complexities are resolved and refined.

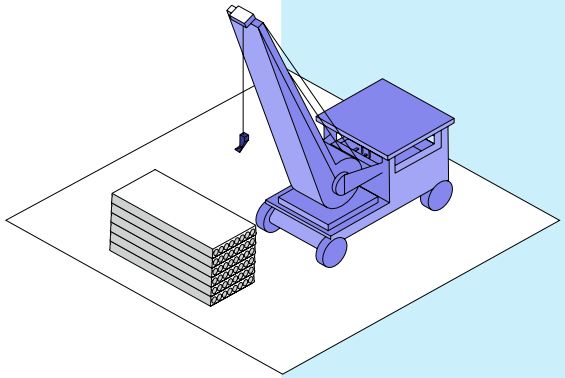
Option 7: UrbanFlow



Option 7: UrbanFlow	Scope	Service Delivery	Rationale
	UrbanFlow is a cross-border resource roundabout which will work as an online portal to provide a database of referenced materials across targeted sectors	UrbanFlow will operate as a partnership between City Councils, manufacturers, waste management companies and circular entrepreneurs. Through the online portal, UrbanFlow will provide data on available materials and products. The organisation will also identify barriers to trade in secondary raw materials and work to provide material passports and achieve certification to enable trade..	A key barrier to the circular use of materials is access to market data (price, location, quality) on reusable materials. This market data needs to be up-to-date and accessible through a digital platform. In addition, where most value-chains cross borders, regulation and legislation is often national. UrbanFlow could unlock flows of trade within and between Belfast and Dublin

Strengths	Weaknesses	Opportunities	Threats
• Active focus on reducing waste. • Strengthens accessibility and availability of materials. • Stimulating the development of methodologies, concepts and materials that facilitate the transition to a circular economy. • Creates a common cross-border value chain • Fostering industrial symbiosis.	• Challenging to align cross-border certification. • May be more suited to implement at a national level rather than a city level. • Requirement for significant increase in storage capacity across businesses and waste management companies.	• Opportunities to access funding such as PEACE funding / EU Green Deal. • Digital innovation opportunities for replication, scaling and export. • Coordinated data opportunities supporting reshoring and new product/ service development opportunities.	• Challenges in attracting and securing the right partners. • Challenges in attracting and retaining the right staff. • Regulatory barriers (e.g., End-of-Waste criteria; Trans-boundary shipments etc.). • Brexit related challenges of movement of goods between jurisdictions.

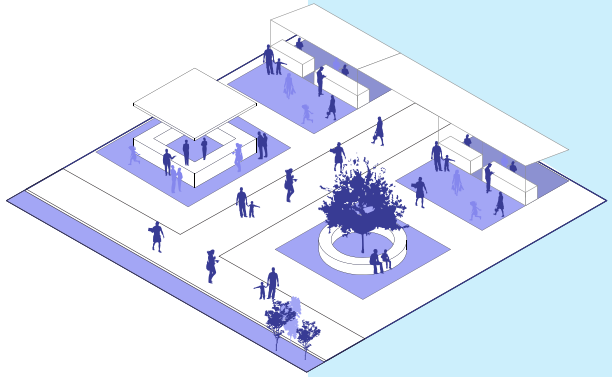
Option 8: WarehouseFlow



Option 8: WarehouseFlow	Scope	Service Delivery	Rationale
	WarehouseFlow is a large-scale project investing in disassembly and segregation of products and materials via materials banks and separation centres in Belfast and Dublin. It could have a specific sectoral focus, appropriate to each city, or a shared sectoral focus.	The services would include advanced warehouses with technologies appropriate for the separation of materials, digital referencing (material passport) of materials in the depot and the classification of materials available for reuse and publication via an open platform. The warehouse or satellite depots could also function as circular depots and repair hubs	The existing infrastructure for material banks in Belfast and Dublin is fragmented. This is leading to a downcycling of materials and weak market incentives for reuse of materials. WarehouseFlow would provide a co-ordinated approach to enable these materials to become secondary raw materials, building supply chain resilience and economic opportunities in each city's economy.

Strengths	Weaknesses	Opportunities	Threats
• Supports the development of new circular technologies. • Reduces waste and its impact on the environment. • Contributes to target. • Provides city-wide and connected material depots. • Builds on the strengths of existing repair hubs and material depots. • Strengthens accessibility and availability of materials.	• Significant capital investment needed for the implementation of new technologies. • Potentially complex public-private-partnerships, including with existing contracted service providers. • Difficulty in aligning cross-border certification. • Limited readiness of priority sectors to drive initial demand for the service.	• Creation of circular economy clusters and specialisation between the cities, benefiting more than one sector. • Opportunity to create the initiative over different phases, e.g. starting with a digital platform material bank (similar to UrbanFlow). • Foster cross-border materials exchanges between the two warehouses. • Opportunity to become the material bank for future construction projects.	• Uncertain ability to attract partnerships. • Challenge of engaging priority sectors. • Challenges with existing /competing service provision. • Regulatory barriers (e.g., End-of-Waste criteria; Trans-boundary shipments etc.). • Brexit related challenges of movement of goods between jurisdictions.

Option 9: RegenPorts



Option 9: RegenPorts	Scope	Service Delivery	Rationale
	RegenPorts is an innovation hub connecting Belfast Harbour and Dublin Port in the transition to a circular economy in both cities. RegenPorts will drive innovation in the circular flow of secondary raw materials and raw materials in both cities, with potential for sector-specific focus in each city.	The RegenPort hubs will be located in ports and provide demonstration sites for innovative circular companies to scale and develop synergies, including through industrial symbiosis. Through partnerships, RegenPorts will develop networks to develop circular value chains across a range of sectors. RegenPorts could also enable aspects of UrbanFlow or WarehouseFlow.	City harbours and ports play a critical role in the economies of Belfast and Dublin. Transitioning to a circular economy at pace and scale requires intervention with potential for transformative impact. RegenPorts presents an opportunity to reinforce the productive relationships between cities and ports, enhancing the role of ports as gateways and matchmakers between producers and traders, and valuable residual material flows.

Strengths	Weaknesses	Opportunities	Threats
• Strongly connected to material flows, waste flows, and imports. • Potential for large scale and longterm portfolio of projects benefiting the ports and the cities. • Utilising space and buildings near cities strengthens impact and demonstration effects.	• Requires advanced stakeholder engagement and resolution regarding complexity of finance and governance arrangements. • Will take several years to achieve scale.	• Circular economy clusters with specialisation across both jurisdictions, impacting on more than one sector. • Opportunity to scale phases such as an initial digital platform material bank similar to UrbanFlow. • RD&I potential re: material segregation and technologies. • Fostering cross-border materials exchanges between the two warehouses.	• Alignment with existing consents and commercial arrangements for ports and harbours. • Land contamination and complexity of retrofitting older buildings. • Regulatory barriers (e.g. End-of-Waste criteria; Trans-boundary shipment). • Brexit related challenges of movement of goods between jurisdictions.


9

OPTIONS ANALYSIS

9. OPTIONS ANALYSIS

The process to determine Emerging Preferred Options for Connected Circular Economy Hubs followed a two-step optioneering process:

Step 1: Preliminary Assessment (Sifting) - this involved a high-level options assessment process that appraised each option in terms of the capacity to deliver against project objectives, whether the option could be practically delivered and whether the option is already being delivered by other organisations. It was recognised that eight of the nine options had some capacity to deliver against project objectives and should be carried forward. The 'BusinessasUsual' option has been carried forward as a counterfactual/ do nothing option.

Step 2: Multi-Criteria Analysis - options which passed Step 1 were carried forward to a more detailed Multi Criteria-Assessment.

MULTI-CRITERIA ANALYSIS OUTLINE

The longlist of options were assessed against a set of defined criteria. The following table outlines each criteria and gives the rating scale for scoring each option:

Investment Objectives	Rating Scale*
Assessment of how well the option meets the overall investment objectives is based on a review of options against the following two sets of criteria: **Project Objectives –** How well does the option deliver against each of the five overarching project objectives. **EU Taxonomy –** How well does the option align or adhere to the four elements specified under Circular Economy criteria within the EU Taxonomy and Sustainable Finance Disclosure Regulation, acknowledging the UK Government is developing a comparable Taxonomy. The four elements are: Design & Production, Circular Use, Circular Value Recovery, Circular Supports. ***NB:** *Ratings for Project Objectives and Taxonomy relates to* **individual objectives / individual elements of the identified taxonomy**, *respectively.*	• **1.00 (Large positive)** • **0.60 (Moderate positive)** • **0.20 (Slight positive)** • **0.00 (Neutral)** • **-0.20 (Slight negative)** • **-0.60 (Moderate negative)** • **-1.00 (Large negative)**
Strategic Fit	**Rating Scale**
Assessment of Strategic Fit is based on a review of options against the following two sets of criteria: **Alignment to key City Council/regional strategies –** How well does the option contribute to the delivery of the key strategies of both City Councils and the related regional strategies. **Connectivity/Cooperation –** How well does the option enable and leverage connectivity and cooperation between both City Councils.	• **1.00 (Large positive)** • **0.60 (Moderate positive)** • **0.20 (Slight positive)** • **0.00 (Neutral)** • **-0.20 (Slight negative)** • **-0.60 (Moderate negative)** • **-1.00 (Large negative)**

Potential Feasibility	Rating Scale
Assessment of feasibility is based on a review of options against the following three criteria: • **Technical** – Are there significant technical requirements required to deliver the option and how readily available these are. • **Internal Delivery Capacity** – Within existing staffing, what is the likely level of internal capacity available within each local authority to deliver the option. • **Consentability** – How likely will the option receive planning consents and other consents, with regard to differing regulatory regimes.	• **1.00 (Feasible)** • **0.80 (Feasible with limited challenges)** • **0.60 (Feasible with moderate challenges)** • **0.40 (Feasible with significant challenges)** • **0.20 (Feasible with very significant challenges)** • **0.00 (Not feasible)**

Potential Feasibility	Rating Scale
Assessment of feasibility is based on a review of the options against the following three criteria: • **Supplier Capacity and Capability** – The level of capacity and capability among external suppliers and partners. • **Affordability** – As there is currently no defined budget envelope for the project – and all options beyond 'do nothing' and 'do minimum' can be scaled for greater reach/impact with businesses – for this deliverable, affordability is given initial consideration within an estimated cost range. This criterion is not scored for this longlist. • **Potential Value for Money** – The likely additionality and displacement arising from each option is used as proxy for value for money for each option in the longlisting exercise.	• **1.00 (Very strong)** • **0.80 (Strong)** • **0.60 (Moderate)** • **0.40 (Weak)** • **0.20 (Very weak)** • **0.00 (Can not progress)**

Opportunities and Impact	Rating Scale
Assessment of potential impact is based on a review of options against the following four criteria: • **Environmental** – Contribution to city level circularity and climate metrics. • **Economic** – Contribution to city level employment and attraction of investment. • **City Region** – Contribution to urban agglomeration and regeneration. • **Social** – Contribution to social value, including quality of life and sustainable places.	• **1.00 (Large positive)** • **0.60 (Moderate positive)** • **0.20 (Slight positive)** • **0.00 (Neutral)** • **-0.20 (Slight negative)** • **-0.60 (Moderate negative)** • **-1.00 (Large negative)**

MULTI-CRITERIA ANALYSIS

	Option 1: Business-as-Usual	Option 2: Circulate	Option 3: Plate	Option 4: RegenPorts	Option 5: HomeLab	Option 6: SocialCircle	Option 7: UrbanFlow	Option 8: Warehouse	Option 9: Do-minimum – Connect
Investment Objectives (-1 to + 1)									
Investment Objectives (x5 objectives; -5 to +5)	-0.40	2.20	3.80	4.20	3.80	2.20	1.80	2.00	1.80
Circular Economy Taxonomy Areas (x4 areas; -4 to +4)	0.00	2.00	1.60	2.80	2.00	2.00	2.40	2.00	0.80
Strategic Fit (-1 to + 1)									
Connectedness / cooperation	0.00	0.60	0.60	1.00	0.60	1.00	0.60	0.20	0.60
Alignment to city-region strategies	0.00	0.60	0.20	1.00	1.00	1.00	0.60	0.20	0.60
Potential Feasibility (0 - 1)									
Technical – level of technical viability	1.0	0.80	1.00	0.80	0.80	0.80	0.60	0.60	1.00
Capacity – level of capacity available to each local authority	1.0	1.00	0.80	0.80	0.40	0.80	0.40	0.40	1.00
Consentability – likelihood of planning consent	1.0	1.00	0.60	0.80	0.60	1.00	1.00	0.80	1.00
Potential Achievability (0 - 1)									
Potential affordability* (based on capital costs + single year of operation)	Nil	€1-€5 million	€20-50 million	€10-20 million	€10-20 million	€5-€10 million	€5-€10 million	€20-50 million	<€1m million
Potential Value for Money / Additionality & Displacement**	0.00	0.60	0.60	1	1	0.60	0.40	1	1
Supplier capacity and capability	1	1	1	0.60	1	0.60	0.40	0.60	1
Opportunities and Impacts (-2 to + 2)									
Environmental impacts	-0.60	0.63	0.70	1.17	1.17	0.70	1.17	1.17	0.23
Economic impacts	-0.60	0.37	0.70	0.77	0.77	0.23	0.23	0.37	0.23
City Region impacts	0.00	0.23	0.63	1.17	1.17	0.23	0.63	0.63	0.23
Social impacts	0.00	0.23	0.77	0.77	0.77	0.77	0.70	0.23	0.23
Overall score	1.4	11.26	13.00	16.88	15.08	11.93	10.97	10.20	9.72

*Within the MCA, above, it is important to note that 'affordability' has not been scored at this point.
**An assessment of Additionality & Displacement for each option has been used as a proxy for Value for Money
In many cases, the development of a SAR/SOC would explore the feasibility and desirability of a single identified project at varying scale, and/or in a variety of locations. Within this SAR/SOC, the need has been to identify what types of Connected Circular Economy Hub could best support the transition to a circular economy in Dublin and Belfast. The scale of all options beyond 'Business-as-Usual' 'Do Minimum' and Urban Flow could be varied depending on site options, availability of capital investment, availability of revenue investment and the buy-in of other partners.
Building from the MCA, further engagement was undertaken with the Connected Circular Economy Steering Committee and the CCE Expert Advisory Group. Through this engagement the options were further evolved, with some of the Emerging Preferred Options also seen as having potential to incorporate positive aspects of options that were not being progressed.


10

EMERGING PREFERRED OPTIONS

10. EMERGING PREFERRED OPTIONS

The preliminary options assessment led to the identification of four Emerging Preferred Options, which includes a 'Do Minimum' option.

Plate, HomeLab and RegenPorts scored highly across each of the four assessment areas.

The Connect (Do Minimum) option received the highest marks in relation to technical feasibility, capacity and consentability. While this option does not offer the same scale of impacts and opportunities, it delivers across a range of objectives and comes with the lowest estimated costs of all options (other than the Business-as-Usual option).

This option is also important where more ambitious options may not be affordable if capital funding cannot be identified. This 'Do Minimum' option could be established with minimal investment as an activation project for the development of Connected Circular Economy Hubs for Belfast and Dublin. It is also envisaged that Connect could serve as a valuable first step in establishing and implementing critical operations for one of the larger-scale Emerging Preferred Options, prior to capital investment.

It is therefore recommended that Connect is also carried forward, as a fourth Emerging Preferred Option.

OPTIONS NOT RECOMMENDED AS EMERGING PREFERRED OPTIONS

Five options are not recommended as Emerging Preferred Options. These options are:

Business as Usual (Do Nothing)

The circular economy will become increasingly prevalent in Ireland and Northern Ireland, with forthcoming regulation and procurement practices just two of the key drivers. Businesses are under-informed and under-prepared for these changes and this will place them at a competitive disadvantage as investment, procurement and consumption models shift to more circular practices. At a broader economic level, this Business-as-Usual option will do nothing to protect city economies from economic shocks that may threaten supply-chain vulnerabilities, nor will it make the cities more attractive for inward investment that is increasingly influenced by sustainability or innovation concerns. For these reasons, this option scored poorly in economic terms.

Business as usual will not help in dealing with waste management and the high volumes of waste exported. Without a dedicated catalyst to drive business transformation, the environmental impact of businesses is likely to worsen. For these reasons the option scored poorly in environmental terms.

The Business-as-Usual option is therefore not seen as an Emerging Preferred Option.

Circulate

The Circulate option was proposed as a Circular Economy Hub for entrepreneurs located in Belfast and Dublin, co-located within existing start-up or innovation hubs, and thus availing of existing start-up ecosystems.

This option did not score highly on strategic fit or likelihood of meeting overall objectives compared to other options. The option also scored moderately in relation to additionality and displacement, acknowledging that there is a growing ecosystem of enterprise hubs in both cities, with collaboration across existing networks. In Dublin, the Guinness Enterprise Centre is developing a broad-based Circular Economy Hub for entrepreneurship. There is also a proposal emerging for regional innovation hubs along the Dublin Belfast Economic Corridor. In time, there will be opportunities for the Connected Circular Economy Hubs to network or collaborate with hubs and programmes in Belfast, Dublin and along the Dublin Belfast Economic Corridor..

SocialCircle

SocialCircle was proposed as a challenge-based investment platform and accelerator programme for circular social innovation in Belfast and Dublin.

This option did not score highly on environmental, economic and city region impacts. It scored highly in terms of strategic fit. There are a growing number of organisations supporting social entrepreneurs and the potential for displacement is significant. Aspects of the option could be rolled out as standalone projects (e.g., challenge funds, participatory budgeting, co-creation with communities) by a Connected Circular Economy Hub, or by existing circular economy or enterprise development partners.

UrbanFlow

UrbanFlow was proposed as a cross-border resource roundabout working as an online library and database of information on materials and products.

This option did not score highly on economic and social impact and likelihood to delivery on the overall project objectives. There are also similar platforms emerging and the possibility for displacement is therefore high. This option could lend itself well to integration with other options that have been identified as Emerging Preferred Options.

WarehouseFlow

The WarehouseFlow option was proposed as product/materials separation centres in Belfast and Dublin with material banks. These centres have potential for a specific sectoral focus appropriate to each city, or a shared sectoral focus.

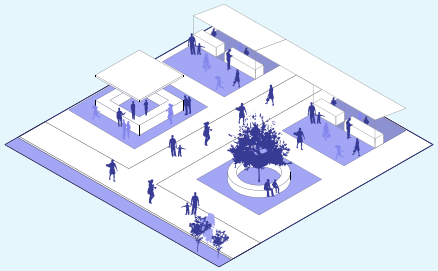
This option scored poorly on strategic fit and did not score highly on economic or social impact and likelihood to deliver on overall project objectives. The capital aspects of the project require large-scale investment from the outset, carrying risks of obsolescence. The operational aspects are potentially risky in terms of displacement and scalability. Over time, this option may be an important support to other options that have been identified as Emerging Preferred Options.

EMERGING PREFERRED OPTIONS

Within the analysis undertaken as part of this SAR/SOC, there are four Emerging Preferred Options. This section gives a more in-depth description of each of these options. This incorporates:

- **Overview** – a high level description of the option.
- **Strategic Fit** – summary of the strategic rationale for the option.
- **Outline of Approach** – high level summary of the approach with consideration of the programmes, platforms, and spatial requirements.
- **LOGIC Model** – an overview of the objectives through inputs, activities, outputs, and outcomes.
- **Examples of Similar Capital Investments** – highlighting aspects of similar capital investments that are comparable to the relevant option.

The RegenPorts option also includes a profile of Belfast Harbour and Dublin Port and outlines transboundary waste shipments which are relevant to this option.



REGENPORTS

OVERVIEW & STRATEGIC FIT

RegenPorts is proposed as Connected Circular Economy Hubs located at Belfast Harbour and Dublin Port, developed in partnership with Belfast City Council and Dublin City Council.

As the primary focal points for the flows of imports and exports for Northern Ireland and Ireland, including significant flows of waste materials, these ports have potential to drive innovation in the circular flow of secondary raw materials and raw materials in both Belfast and Dublin, along the Dublin Belfast Economic Corridor, and have a significant impact on the wider economies of Northern Ireland and Ireland.

RegenPorts would target existing companies trading through the ports, start-ups, and scale-ups, as well as universities and other research and innovation partners.

Strategic Drivers for Ports

In its 'Trends in EU Port Governance 2022' report, The European Sea Ports Organisation surveyed 72 port managing bodies from 20 EU Member states, including Dublin Port. Of the port managing bodies surveyed, 70% have a circular economy strategy in place.

The report shows that the main drivers for advancing the circular economy are the ports' own strategies (76%), national policies (62%) and the industries located in ports (57%). Port managing bodies are playing a variety of roles in these circular economy initiatives. The top five roles identified were:

- Facilitator 86%
- Provider of land 79%
- Initiator 50%
- Logistics support 29%
- Co-Investor 18%

Circular economy initiatives in ports around the world are mainly carried out in the waste and energy sectors with a particular focus on enabling industrial symbiosis between the diverse enterprises located in and connected to the port.

Industrial symbiosis looks at the stages of production processes of goods and services, within which different entities establish networks of actors to share resources such as materials, energy, information, services, or technologies. Many ports are allocating space to new eco-industrial parks in areas where ports intersect with industrial areas.

Strategic Fit

RegenPorts aligns with the strategic ambitions of Belfast City Council and Dublin City Council for the circular economy and the competitiveness of both cities, as well as and the Belfast Harbour and Dublin Port masterplans.

RegenPorts also aligns to Belfast Harbour and Dublin Port strategies that aim to ensure synergies and integration between the Port/Harbour areas and their respective cities, as well as the spatial and infrastructural opportunities arising from the energy transition and associated storage needs.

Both Belfast Harbour and Dublin Port are also engaged in key strategic initiatives of relevance to this proposal. Belfast Harbour is advancing plans for a Net Zero Park of 13 acres within the Port Area and engaged in developing a Decarbonisation Plan. In September 2023, Dublin Port signed Agenda 2030 by International Association of Ports and Cities. The AIVP Agenda

2030 is a framework that seeks to develop sustainable port-city integration strategies across ten goals, including the energy transition and circular economy.

Recent engagement with Belfast Harbour indicates an openness to the idea of RegenPorts, although representatives noted that the Harbour currently has a significant body of work ongoing in relation to sustainability and other areas.

Engagement with Dublin Port indicated that the Port does not see an immediate fit for the Connected Circular Economy Hubs project on-site, highlighting that Dublin Port is a transitory port (unlike Belfast Harbour, which has a significant enterprise base on-site). It was noted that Dublin Port also has limited engagement, or data, in relation to goods transiting through the port. Dublin Port also noted the pressure on space within the Port, which would make the allocation of space for new initiatives challenging, particularly in relation to material banks.

OUTLINE APPROACH

RegenPorts frames the opportunity for Belfast Harbour, Dublin Port, and the two City Councils across three levels. These are:

Circularity of Ports Assets and Equipment – optimisation of port capacity and lifetime extension of port assets and infrastructure such as buildings, cranes, quays, buoys and other equipment through maintenance and smarter use. (e.g., Leasing, Asset sharing, Green Procurement, Circular repair of assets, Remanufacturing).

Creating Value from Circular Flows of Materials and Energy – identifying new uses for material flows through ports from cities, waste, and by-products of industries within ports and waste generated by port activities, such as ship and port (e.g., Biorefining, Bioenergy, Upcycling, Cascading, Repair).

Ports Enabling Circular Markets – ports enabling other industries and businesses to become more circular by developing new activities that connect supply and demand for circular resources targeted at the material moving through the port. (e.g., Industrial ecology, New business from by-products, Material banks. Material flow Data services).

Figure 10: Outline Approach of RegenPorts

DELIVERING THE APPROACH

RegenPorts would operate with 7 staff across Belfast and Dublin; with at least 3 FTE staff based in each city, and a CEO based in either Belfast or Dublin. The breakdown of staff, as set out below, does not include for additional staffing required for material banks:

1 x Director / CEO

- Based in either Belfast or Dublin and working across both cities. The Director/CEO would drive RegenPorts as the Connected Circular Economy Hub project at a strategic level, including on strategic partnerships.

2 x Head of Circular Innovation Programmes (HCIP)

- 1 x HCIP based in Belfast and 1 x HCIP based in Dublin. The HCIPs would lead on enterprise and innovation engagement beyond the walls of RegenPorts – driving and supporting businesses to innovate in transitioning to a circular economy, and engaging with research performing organisations on innovation that could be adopted or adapted for commercial use. The HCIP roles would include external communications on behalf of RegenPorts.

2 x Head of Community & Ecosystem (HC&E)

- 1 x HC&E based in RegenPort Belfast, and 0.5 x HC&E based in RegenPort Dublin. The HC&Es would be focused on nurturing and supporting start-ups and businesses within each of the RegenPort Incubation Hubs – providing mentoring and guidance and connecting these businesses with each other and with partners or agencies who can help drive their businesses forward.

2 x Lab/Workshop Managers

- 0.5 x Lab/Workshop Manager based in Belfast and 0.5 x Lab/Workshop Manager based in Dublin. The Lab/Workshop Managers would be responsible for the management of the workshop spaces in each RegenPort hub, including scheduling, maintenance, technical support, health & safety and the running of the workshops to enable product innovation and prototyping. These are part-time roles, which would expand in line with demand.

1 x Project Manager – Funding & Grants

- Based in either Belfast or Dublin. The Project Manager for Funding & Grants role is focused on generating revenue, grants and sponsorship for programmes and projects being developed and delivered by RegenPorts to drive innovation for enterprise.

1 x Finance Officer – Part-time

- 1 x part-time (0.5 FTE) Finance Officer. The Finance Officer will take responsibility for the finances of the hub, from payroll to invoicing of tenants and service users.

LOGIC MODEL

NEEDS AND CONTEXT
Climate change, the energy transition and the circular economy are placing renewed focus on ports as they play a strategic role in keeping supply chains going and ensuring that citizens all have the energy and materials they need. As the energy transition accelerates, ports are ensuring resilience by expanding into new roles as hubs of energy, circular economy, and blue economy by creating partnerships that attract new businesses to the port while bringing the port and city closer together.

POLICY CONTEXT
Belfast City Council and Dublin City Council Development plans, Climate Action/Net Zero Plans, Belfast Harbour and Dublin Port masterplans

Government of Ireland National Development Plan, Northern Ireland Circular Economy Strategy.

OPTION OBJECTIVES
Create spaces for collaboration and circular innovation that bring together Belfast Harbour and Dublin Port, Belfast and Dublin City Councils, companies, start-ups, universities and researchers.

INPUTS
- Coordination & management team (co-located).
- Space and buildings.
- Partnerships - businesses located in and near ports.

ACTIVITIES
- Industrial Symbiosis.
- Enterprise incubation.
- Prototype testing.
- By-product processing.
- Repair schemes.
- Public events.
- Business events.

OUTPUTS
- Premises secured.
- New business opportunities identified.
- Prototypes tested.
- Infrastructure developed.

IMPACTS
Objective 1 - New enterprise
Objective 2 - Existing enterprise
Objective 3 - Waste
Objective 4 - Innovation
Objective 5 - Net Zero

OUTCOMES
- Waste diverted from landfill (T/inhabitant/year or %).
- By-product or waste reused as material (T/inhabitant/year or %).
- CO_2 emissions saved (T CO_2/capita or %).
- Virgin material use avoided (T/inhabitant/year or %).
- Number of new circular business.
- Number of businesses adopting circular economy principles.
- Economic benefits (e.g., through additional revenue and costs saving) (EUR/year).
- Number of employees in new circular businesses.
- Number of jobs created in the circular economy.
- Number of procurement contracts including circular criteria (number of contracts per year/expenditure per year, %).
- Number of companies or employees trained to adopt circular economy principles.
- Number of contracts awarded that include a circular economy criterion/Total no. of contracts.
- % of public investment dedicated to circular economy policy/Total public investment.

EVALUATION STRATEGY
Impact evaluation that will randomise participants, tracking participants' and control groups.

Evaluation will focus on understanding employment and circularity outcomes (i.e., whether participants secure employment and impact on at least 3 indicators in the circular economy reporting framework).

Data collection will start at recruitment, so it will be important for an evaluation lead to be designated at the start.

Participant companies will be tracked for 6 months after each initiatives finishes, including those companies which do not complete engagement in the initiative.

EXAMPLES OF SIMILAR CAPITAL INVESTMENTS

The circular economy initiatives undertaken by ports extend the reach and potential of ports beyond the traditional roles of administering land, oversight of logistics, and regulating nautical safety.

The transition to the circular economy involves a broader range of activities which adds value to the wider port community, logistics chains, business and trade, and the wider operating environments for ports.

A common capital investment in circular port initiatives is the development of hubs that act as incubator spaces for start-ups, meeting spaces of port/harbour-located businesses and exhibition space for the public.

Some of these hubs utilise existing buildings within the port/harbour estate, and others look at options such as shipping container buildings or new builds.

Relevant examples of these incubator spaces can be seen in Prodock at Amsterdam Port and homePORT at Hamburg Port.

INCUBATOR SPACE - PRODOCK (AMSTERDAM)

INCUBATOR SPACE - HOMEPORT (HAMBURG)

PROFILE OF PORTS

This option was developed in the full understanding that Belfast Harbour and Dublin Port have different profiles in terms of spatial characteristics, tenant businesses and governance. The table below compares the two port areas in relation to key factors:

	Belfast	Dublin
Area (acres)	2000	640
Liquid bulk	2,182	4,652
Dry bulk	6,677	1,821
Containers	1,756	5,802
RoRo	7,569	14,040
Other	331	17
Cargo (t)	18,515	26,332
Enterprises based in port/harbour	750	0
Seaborne trade handling	67% of NI	50% of ROI

Figure 11 provides a map of each port and outlines the landcover, transportation, locations, and general features.

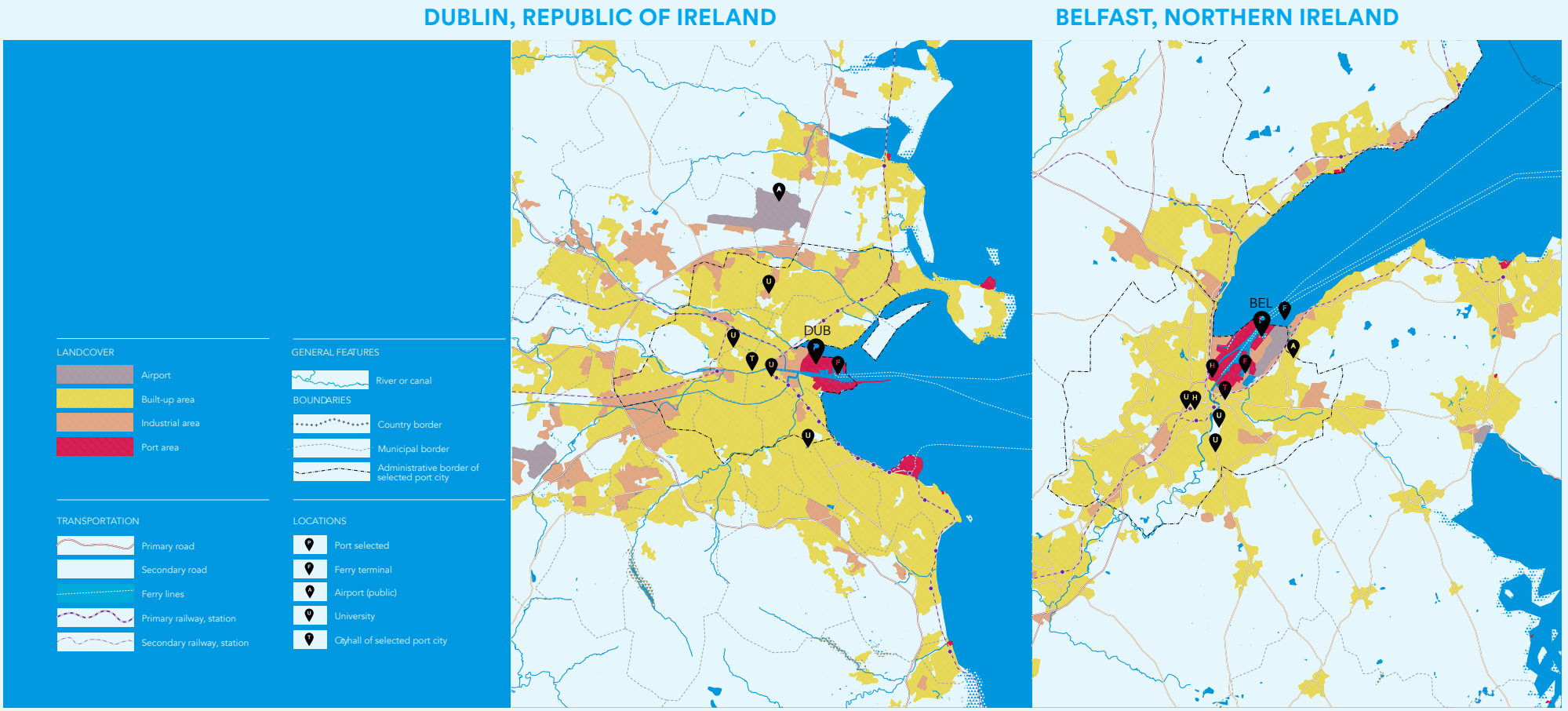


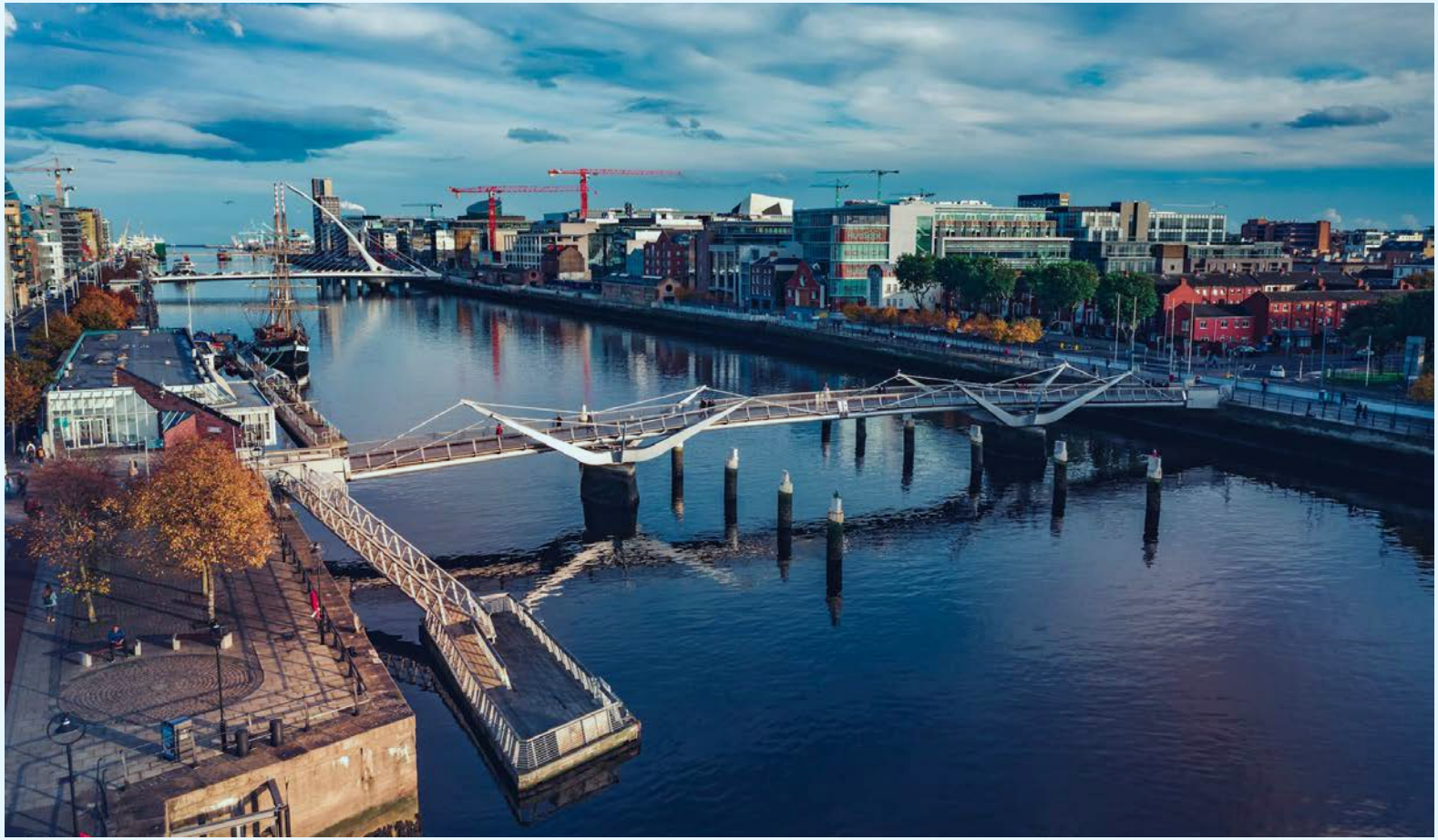
Figure 11: Map of Belfast Harbour and Dublin Port

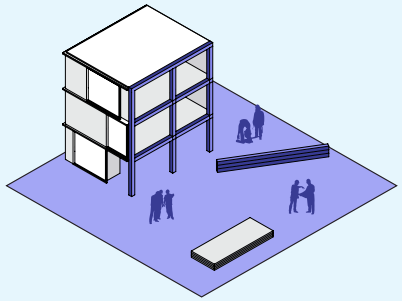
TRANSBOUNDARY SHIPMENT OF WASTES

One of the strategic options for RegenPorts is developing commercial opportunities around circular flows of materials and energy within ports and between ports and cities. This will involve identifying new uses for by-products of industries within ports and waste generated by port activities.

There are significant volumes of transboundary shipments of waste between Ireland and Northern Ireland, some of which is destined for export. Available data in this area highlights that Northern Ireland is the primary destination for wastes exported from Ireland (National TFS Office, 2023).

This presents a significant opportunity to examine circular opportunities such as identifying new uses for material flows through ports from cities.





HOMELAB

OVERVIEW & STRATEGIC FIT

HomeLab is a longterm demonstrator focusing on scaling up circularity in the built environment, public realm and housing sectors in Belfast and Dublin.

HomeLab will require a physical hub in both cities that provides spaces for collaboration and circular innovation between Belfast and Dublin City Councils, Northern Ireland Housing Executive, Land Development Agency, construction sector companies, start-ups, universities, and researchers.

Strategic Drivers

Almost half of the raw materials used in Europe are in construction materials. Also, construction and demolition waste accounts for almost 30% of all waste. Globally, buildings and construction account for almost 40% of global carbon emissions.

While there have been significant advances in improving the operational energy efficiency of buildings, there is growing concern for embedded carbon in building products and construction materials. This includes full life cycle carbon across material extraction, processing, transportation, and construction works.

Belfast and Dublin City Councils are managers of large portfolios of real-estate assets and urban infrastructures (e.g., parks and public realm). As regulators and enablers of construction through zoning and permitting, both City Councils have a key role to play in integrating and implementing a circular economy model for the built environment.

This role can span specification of construction materials in civil and building works, and the value chain from building disassembly to new construction.

By applying circular economy principles to public construction projects and supporting the growth of a local circular economy sector, Belfast and Dublin City Councils can:

- **Keep City Construction Materials** in use and retain their value, thus avoiding waste
- **Reduce the Embedded Carbon** of Construction materials and lessen the environmental impact of raw material demand
- **Stimulate Market Innovation for less resource-intensive materials** and low-carbon construction methods.

HomeLab aligns with the regeneration and investment plans in Belfast and Dublin, as well as the ongoing investment to address housing needs in each city. This option also represents an opportunity for partnership and collaboration between the two cities in a sector with significant leverage to re-shape economic models, reduce waste volumes and enable stronger and more competitive supply chains to meet the sustained construction demand in the coming decades.

Strategic Fit

HomeLab delivers against a key target sector of the Northern Ireland Circularity Gap Report, with the construction and maintenance of the built environment accounting for 35% of Northern Ireland's total material consumption. HomeLab also delivers against an identified priority area for Ireland where the EPA estimates that construction waste accounts for almost 50% of all Irish waste. The Government of Ireland is currently developing a Construction Sector Circular Economy Roadmap.

HomeLab aligns to the strategic directions of both Belfast City Council and Dublin City Councils as well as the sustainability ambitions of Northern Ireland Housing Executive.

It also aligns to strategic documents and plans such as the Belfast Agenda (Theme 3), Building Impact: Renewed Ambition report for Belfast, and the Public Realm Masterplans for Dublin Port.

HomeLab could also support the Northern Ireland Housing Executive plans to establish a Net Zero Centre of Excellence for training and awareness purposes for tenants, staff, trade apprentices and contractors. The overall vision for this centre also involves the potential to expand the training facility out to other public bodies.

This option also has direct synergies with the Construction Materials Exchange project from the Irish Green Building Council and, in a Dublin context, could also harness the potential within existing initiatives such as the Digital Twin Modelling for Climate Resilient Housing in Dublin City Council.

The proximity of Belfast and Dublin presents strategic opportunities for Connected Circular Economy Hubs to underpin the construction economies of the two cities by enabling the transition of this key sector to circular economy models.

A key barrier to the viability of a circular economy in construction and secondary construction material markets is logistics. By creating digital and physical platforms and a system-wide coordination of efforts, HomeLab will accelerate private sector contributions to a circular construction sector in and between Belfast and Dublin.

HomeLab creates dedicated coordination roles that will facilitate material circulation, and build relationships between key stakeholders in the construction value chain in Ireland and Northern Ireland, and between the construction economies of both cities.

A key coordinating function will be to provide access to information on waste with potential to be a resource, or input to other construction processes, including transboundary shipments.

While the approach of HomeLab will drive innovation across the construction cycle for public housing and public sector capital projects (see Fig.13), it will significantly impact on the middle stages of these processes; from design, through material inventory and material harvesting, to material and product distribution. This is not to downplay the importance of the other four stages, particularly the financing stage; where future construction investment and financing is likely to rely on alignment with circular economy taxonomies.

Creating circular depots or physical hubs for material storage and/or circular economy activities are likely to become key resources in supporting local construction SMEs in their transition to a circular economy. HomeLab hubs will also raise awareness of both cities' circular construction approaches as they seek to remain competitive in attracting funding and inward investment for housing and infrastructure development.

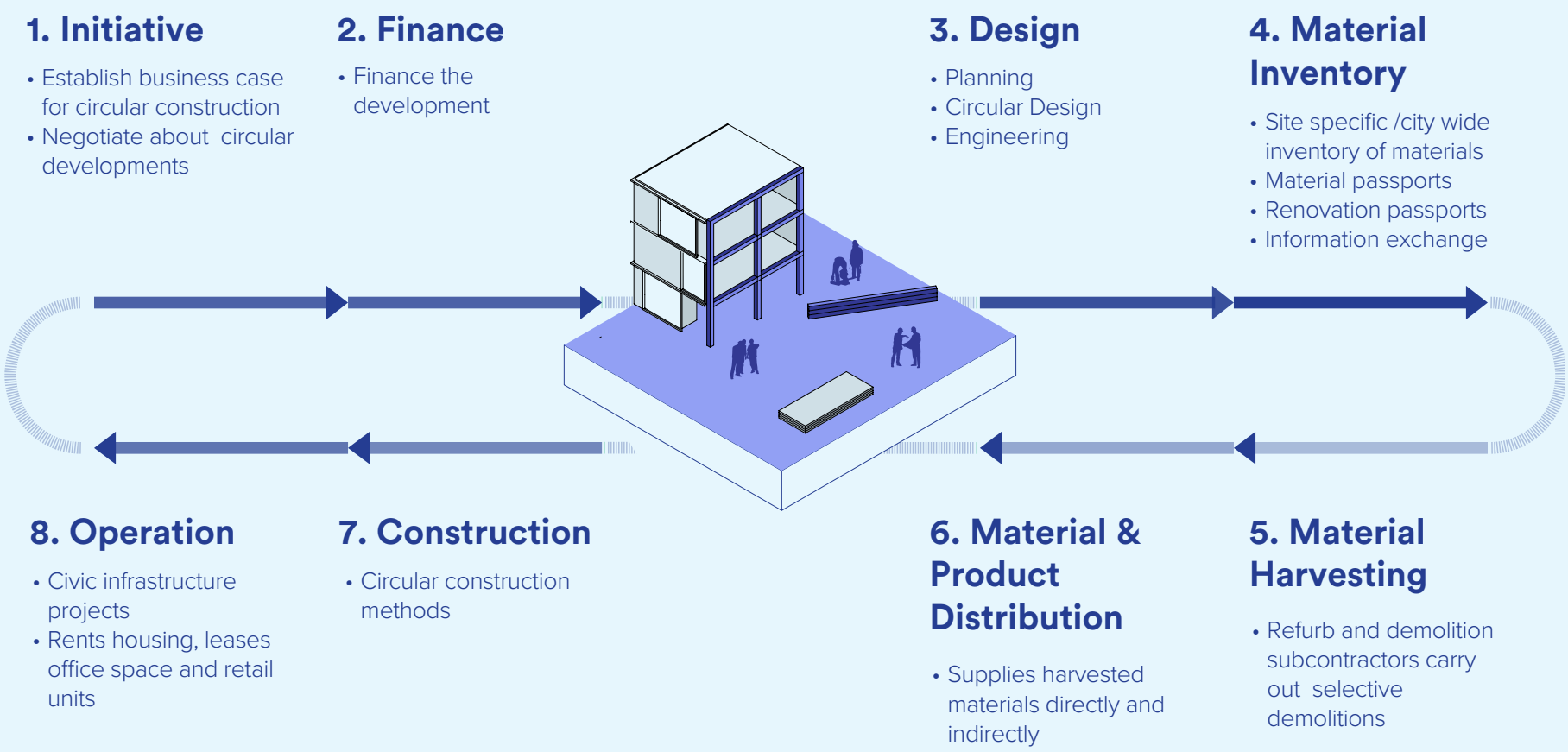


Figure 12: Stages of Public-sector Circular Construction Projects

OUTLINE APPROACH

HomeLab frames the offering for the construction economies of Belfast and Dublin across four levels (See Fig.12) of Programmes, Platforms, Flows, and Policy through which HomeLab can drive circular construction initiatives, such as:

Policy

- Procurement requirements for life-cycle assessment calculations, environmental cost indicators and environmental product declarations for construction materials
- Creation of a ‘circularity index’ to compare tenders in procurement that consider value maintained, (e.g., of concrete infrastructure).

Flows

- Selective demolition of public buildings and infrastructure to recover contained materials and components.

Platforms

- Testing of digital tools for tracking material composition, quantity, and quality (material passports/ buildings as material banks), with the potential to collaborate with the Irish Green Building Council’s Construction Material Exchange platform.

Programmes

- Inclusion of reclaimed materials and components in new constructions or renovations of social housing (doors, bricks, floorboards, furniture) and public infrastructure such as parks
- Council-led material banks, circular depots and circular excavated land mass coordination between all construction sites in the city
- Social urban mining cooperating with social economy enterprises to remove, separate and transform secondary construction materials
- On-site transformation of old concrete for new recycled aggregate.

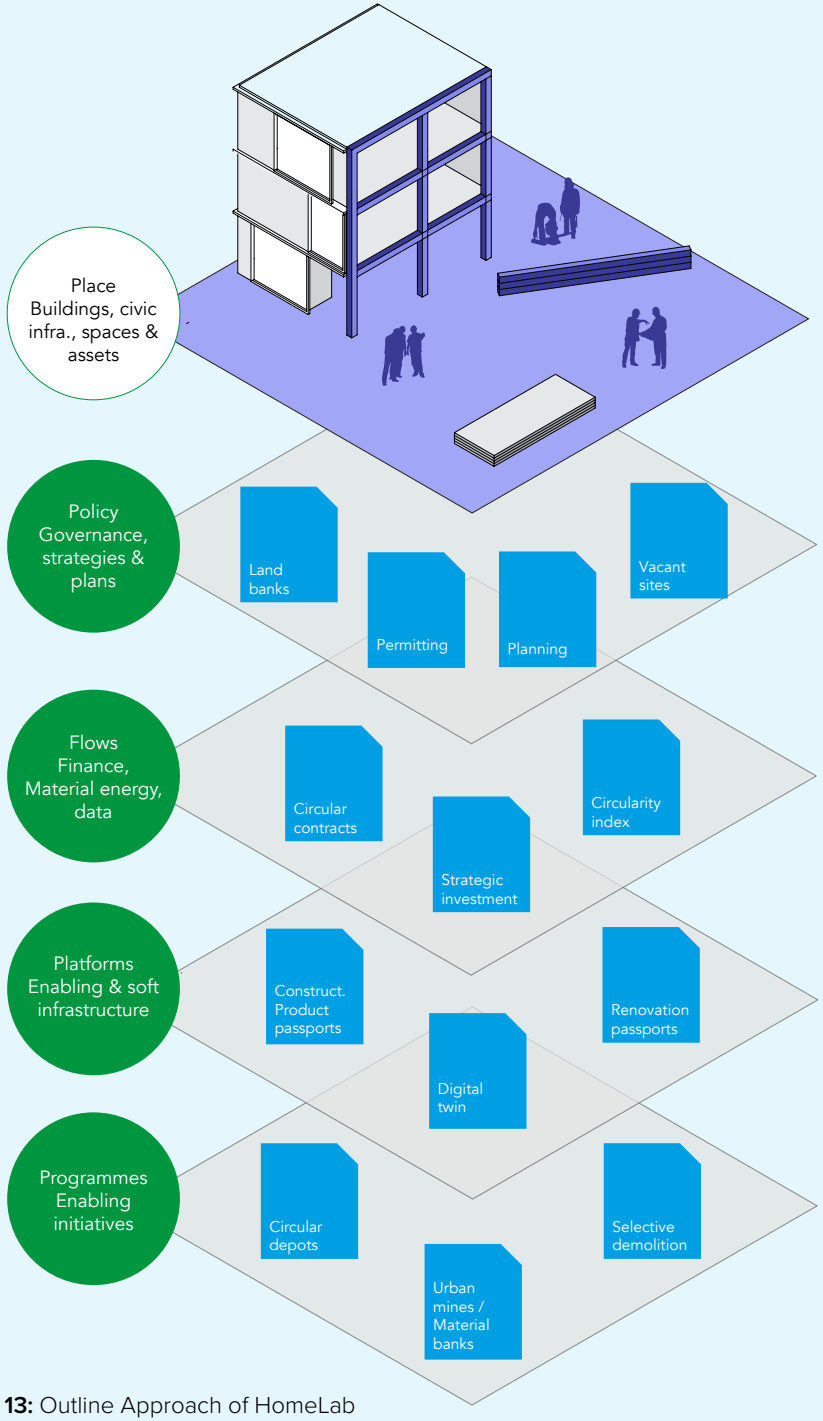


Figure 13: Outline Approach of HomeLab

DELIVERING THE APPROACH

HomeLab would operate with 8.5 staff across Belfast and Dublin; with at least 3 staff based in each city, along with a CEO and an additional part-time finance officer based in either Belfast or Dublin. The breakdown, as set out below, does not include staffing for material banks:

1 x Director / CEO

- Based in either Belfast or Dublin and working across both cities. The Director/CEO would drive HomeLab as the Connected Circular Economy Hub project at a strategic level, including on strategic partnerships.

2 x Head of Circular Innovation (HCI)

- 1 x HCI based in Belfast and 1 x HCI based in Dublin. The HCIs would be required to have and maintain an in-depth knowledge of innovation in circular construction techniques and materials. Identifying available options, framing their application within construction processes, 'selling' the approach to the construction sector, and capacity building are key elements of the HCI roles.

2 x Programme Managers – Circular Innovation

- 1 x Programme Manager based in Belfast and 1 x Programme based in Dublin. Reporting to the HCIs, the Programme Managers would work directly on delivery of key demonstrator circular construction projects to support their delivery and capture learnings arising.

1 x Project Manager – Funding & Grants

- Based in either Belfast or Dublin. The Project Manager for Funding & Grants role is focused on generating revenue, grants and sponsorship for programmes and projects being developed and delivered by HomeLab to drive innovation in the construction sectors in Belfast and Dublin.

1 x Project Manager - Inventories

- Based in either Belfast or Dublin. The Project Manager for Inventories would be responsible for maintaining and publishing data on the inputs, materials and stock levels available to HomeLab and its users, as well as tracking material flows from input stage through to readily available outputs..

1 x Project Manager – Communications

- Based in either Belfast or Dublin. The Project Manager for Communications would lead on all communication and marketing for HomeLab, with a particular focus on documenting and disseminating the learnings, successes, and opportunities of HomeLab to the construction sector.

1 x Finance Officer – Part-time

- 1 x part-time (0.5 FTE). The Finance Officer will take responsibility for the finances of the hub, from payroll to invoicing of any hub/hotdesk tenants and service users.

LOGIC MODEL

NEEDS AND CONTEXT

Belfast and Dublin City Councils are managers of large portfolios of real-estate assets and urban infrastructures (e.g., parks and public realm). As regulators and enablers of construction through zoning and permitting they both have a key role to play in implementing the Circular Economy in the built environment. While there have been significant advances in improving operational energy efficiency of buildings, there is growing concern for embedded carbon in building products and construction materials. This includes full life cycle carbon across material extraction, processing, transportation, and construction works.

POLICY CONTEXT

Belfast City Council and Dublin City Council Development plans, Climate Action/Net Zero Plans

Government of Ireland National Development Plan, Northern Ireland Circular Economy Strategy.

OPTION OBJECTIVES

Create space for collaboration and circular innovation between Belfast and Dublin City Councils, Northern Ireland Housing Executive, Land Development Agency, construction sector companies, start-ups, universities and researchers.

INPUTS

- Coordination & management team (co-located).
- Spaces & buildings.
- Partnerships: construction sector, developers, investors.
- Research, Digital tools.

ACTIVITIES

- Material Flow Analysis.
- Material banks.
- Certification.
- Prototype testing (construction products).
- Public events.
- Business events.

OUTPUTS

- New procurement opportunities identified.
- Circular prototypes tested.
- Infrastructure developed.
- Regulatory barriers overcome.

IMPACTS

Objective 1 - New enterprise

Objective 2 - Existing enterprise

Objective 3 - Waste

Objective 4 - Innovation

Objective 5 - Net Zero

OUTCOMES

- Waste diverted from landfill (T/inhabitant/year or %).
- By-product or waste reused as material (T/inhabitant/year or %).
- CO_2 emissions saved (T CO_2/capita or %).
- Virgin material use avoided (T/inhabitant/year or %).
- Number of new circular business.
- Number of businesses adopting Circular Economy principles.
- Economic benefits (e.g., through additional revenue and costs saving) (EUR/year).
- Number of employees in new circular businesses.
- Number of jobs created in the Circular Economy.
- Number of procurement contracts including circular criteria (no. of contracts per year/expenditure per year, %).
- Number of companies or employees trained to adopt circular economy principles.
- Number of contracts awarded that include a circular economy criterion/Total no. of contracts.
- % of public investment dedicated to Circular Economy policy/Total public investment.

EVALUATION STRATEGY

Impact evaluation that will randomise participants, tracking participants' and control groups.

Evaluation will focus on understanding employment and circularity outcomes (i.e., whether participants secure employment and impact on at least 3 indicators in the circular economy reporting framework).

Data collection will start at recruitment, so it will be important for an evaluation lead to be designated at the start.

Participant companies will be tracked for 6 months after each initiatives finishes, including those companies which do not complete engagement in the initiative.

EXAMPLES OF SIMILAR CAPITAL INVESTMENTS

Existing circular housing initiatives are mainly focused on restructuring approaches within the housing sector to integrate more circular solutions.

A common driver in circular housing sector initiatives is rethinking the management and use of water, waste, energy, and material resources for all stages of the waste-intensive, energy-intensive, and resource-intensive housing life cycle.

A common capital investment in circular construction is the enabling infrastructure such as material banks, digital platforms, and circular depots. These enable circularity in public construction projects and support the growth of the local circular economy.

Beyond the resources and initiatives that can be put in place by a project such as HomeLab, the leverage and transformative potential of the project is grounded in the buy-in it achieves in the alignment of public spending on public realm investment, housing and other construction and infrastructure projects.

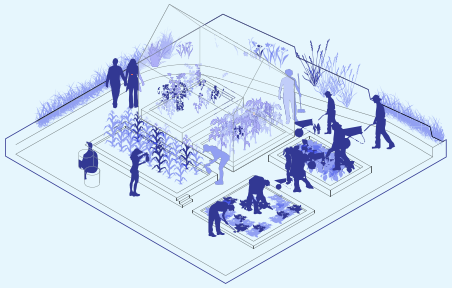
Examples relevant to this model include Madaster, Circular Social Housing at Kerkrade in the Netherlands, and Construction Material Exchange from the Irish Green Building Council.

CIRCULAR SOCIAL HOUSING – KERKRADE (NETHERLANDS)



MADASTER – NETHERLANDS

CONSTRUCTION MATERIALS EXCHANGE (CMEX)



PLATE

OVERVIEW & STRATEGIC FIT

Plate is proposed as a specialised incubator and demonstrator programme supporting circular food and hospitality businesses.

Plate was the third highest scoring option following the Multi-Criteria Analysis. Plate did not, however, score as well as other Emerging Preferred Options in relation to additionality and displacement, given that there is some existing provision of food hubs and food/agri-food research and innovation centres in both Ireland and Northern Ireland.

The objective of Plate is to create an incubator programme for circular food and hospitality entrepreneurs in and between Belfast and Dublin, through the network of two specialised Circular Economy Hubs focused on the food and hospitality sectors.

These Plate hubs will provide R&D labs for processing and ingredient innovation, circular packaging, affordable commercial kitchen and retail kiosk space, service & business model innovation. It will also include city wide collection infrastructure, connections to market channels and dedicated waste processing (anaerobic digestion, scaled composting).

Strategic Drivers

The food and hospitality sectors are key sectors of the economies in Ireland and Northern Ireland. Belfast and Dublin have a unique opportunity to spark a transition towards a circular economy for food. Pressures on food systems, the ability to adapt to climate change, and the volumes of food waste are key issues that Belfast and Dublin are addressing through Belfast's Sustainable Food Partnership and the (Draft) Edible Dublin Strategy.

Considering the significant waste volumes and associated greenhouse gas emissions generated from the food and drink sectors, having a more circular food economy is required not only to meet city and national level targets, but also presents opportunities for significant positive economic, health, and environmental impacts across the food value chain and society more broadly.

There are existing circular food initiatives and enterprises across both cities, mainly focusing on sustainable catering, packaging, plant-based food innovation, and increasing accessibility to healthy food. However, these resources require enabling and supporting infrastructure to scale to the level that is needed to achieve both city and national food waste targets.

There are also demonstrator programmes, and exemplar projects in Europe and the United States focusing on creating circular food networks and initiatives across their major cities. Many of these initiatives connect enterprises to create synergies that assist these enterprises in exploring innovation practices, and increasing inputs of waste back into production lines, with the overall aim of reducing food waste.

The strategic directions of Belfast and Dublin point towards continuing population growth and to very strong tourism and hospitality sectors. Given the existing networks of circular food initiatives and enterprises in each city, there is an opportunity to enhance the circularity of each city, through connecting and optimising their circular food resources.

Strategic Fit

Bioeconomy and tourism/hospitality are priority areas within the Northern Ireland Circularity Gap Report. Food is also a priority within the Irish EPA's Circular Economy Programme.

The Plate option will harness synergies between the strategies and the targets for food waste prevention and reduction in each city and jurisdiction.

This option also aligns to the wider food, hospitality, and agri-food ecosystem for both cities.

Developing Plate as a Circular Economy Hub would align with the Northern Ireland Food Strategy Framework, the Food and Drink Tourism Plan for Belfast, and Belfast's Sustainable Food Partnership. Plate would also help to deliver on Theme 4 of the Belfast Agenda.

In Dublin, Plate would support the ambition of the Dublin City Council Climate Action Plan, the (Draft) Edible City Strategy and the Dublin City Council Economic Development Strategy 2022 – 2024.

Plate would build on existing networks such as Dublin Food Chain and align with the work of the Food Innovation Lab in TU Dublin.

The diversity of food entrepreneurs in both cities, and potentially along the Dublin Belfast Economic Corridor, also provides a platform to create strategic economic opportunities for the food and hospitality economies of both Belfast and Dublin, while enabling the transition to a vibrant circular economy.

A key decision within Circular Economy Hubs that focus on food, relates to provision of an anaerobic digestor. Such a facility has significant potential in relation to the production of energy, and can also support the production of fertilisers. However, provision of an anaerobic digestor requires additional space, and impacts on the consentability and location of such facilities.

Were an anaerobic digestor brought forward as a central part of Plate Circular Economy Hubs in Belfast and Dublin, the location of such a facility would need careful consideration. In principle, a facility such as Plate also aligns well with the strategic directions the Belfast Harbour and Dublin Port masterplans.

OUTLINE APPROACH

Plate frames the opportunity for the food and hospitality sectors in the Belfast and Dublin economies across two levels as set out in Figure 14. They are:

Enterprise Supports
Providing a range of supports directly to food start-ups and entrepreneurs and linking into the existing food enterprise ecosystem in both cities. (e.g., Financial supports, Advice and Mentoring, Accelerator Programmes).

Circular System Building
Enabling circular innovation in the food sector in both cities by creating enabling infrastructures. (e.g., Data development. Regulatory Sandboxes, Research, Circular Contracting).

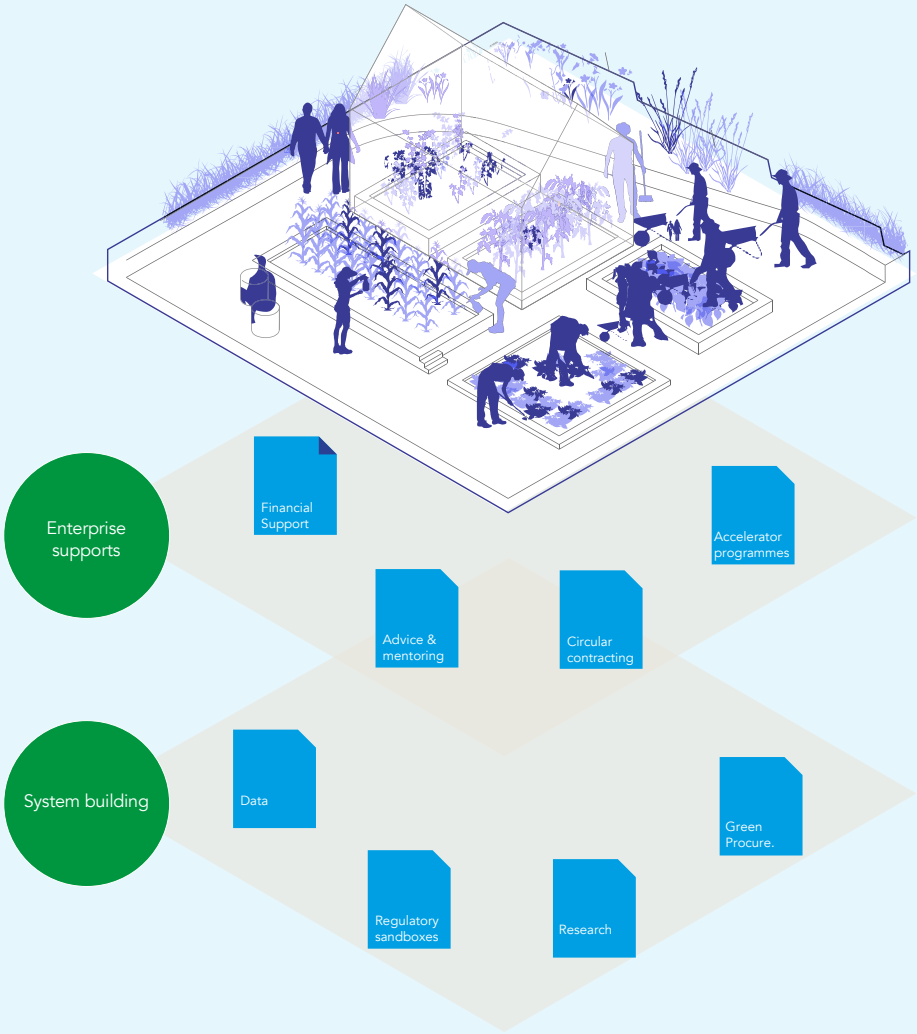


Figure 14: Outline Approach of Plate

DELIVERING THE APPROACH

Plate would operate with 6.5 staff across Belfast and Dublin; with at least 2.5 staff based in each city, along with a CEO and an additional part-time finance officer based in either Belfast or Dublin. The breakdown of staff would be as follows:

1 x Director / CEO

- Based in either Belfast or Dublin and working across both cities. The Director/CEO would drive Plate as the Connected Circular Economy Hub project at a strategic level, including on strategic partnerships.

2 x Head of Circular Innovation Programmes (HCIP)

- 1 x HCIP based in Belfast and 1 x HCIP based in Dublin. The HCIPs would lead on enterprise and innovation engagement beyond the walls of Plate – driving and supporting existing food and hospitality businesses to innovate in transitioning to a circular economy, and engaging with research performing organisations on innovation that could be adopted or adapted for commercial use within the food and hospitality sectors. These are full-time roles. The HCIP roles would include external communications on behalf of Plate.

2 x Head of Community & Ecosystem – Part-time (HC&E)

- 0.5 x HC&E based in Plate Belfast, and 0.5 x HC&E based in Plate Dublin. The HC&Es would be focused on nurturing and supporting start-ups and businesses within each of the Plate Hubs – providing mentoring and guidance and connecting these businesses with each other and with possible partners or agencies who can help drive their businesses forward. The HC&E roles would include internal communications on behalf of Plate.

2 x Operations Managers

- 1 x Operations Manager based in Belfast and 1 x Operations Manager based in Dublin. The Operations Managers would be responsible for the management of the Plate Hubs in each city, including scheduling, maintenance, technical support, cleaning, health & safety, and the running of shared services to ensure that optimum value is derived from the facility. These are full-time roles.

1 x Finance Officer – Part-time

- 1 x part-time (0.5 FTE). The Finance Officer will take responsibility for the finances of the hub, from payroll to invoicing of tenant businesses and service users.

LOGIC MODEL

NEEDS AND CONTEXT
There are existing circular food initiatives and enterprises across both cities, mainly focusing on sustainable catering, packaging, plant-based food innovation, and increasing accessibility to healthy food. However, these resources require enabling and supporting infrastructure to scale to the level that is needed to achieve both city and national level targets.

POLICY CONTEXT
Belfast City Council and Dublin City Council Development plans, Climate Action/Net Zero Plans

Government of Ireland National Development Plan, Northern Ireland Circular Economy Strategy.

OPTION OBJECTIVES
Create spaces to run incubator programme for circular food and hospitality entrepreneurs in and between Belfast and Dublin.

INPUTS
- Coordination & management team (co-located).
- Incubation spaces.
- Partnerships – businesses.
- Research.
- Feedstocks.
- Biodigestors.

ACTIVITIES
- Enterprise incubation.
- Prototype testing (ingredients).
- By-product processing.
- Public events.
- Business events.

OUTPUTS
- Premises secured.
- New business opportunities identified.
- Prototypes tested.
- Infrastructure developed.
- Regulatory barriers overcome.

IMPACTS
Objective 1 - New enterprise
Objective 2 - Existing enterprise
Objective 3 - Waste
Objective 4 - Innovation
Objective 5 - Net Zero

OUTCOMES
- Waste diverted from landfill (T/inhabitant/year or %).
- By-product or waste reused as material (T/inhabitant/year or %).
- CO_2 emissions saved (T CO_2/capita or %).
- No. of new circular business.
- No. of businesses adopting circular economy principles.
- Economic benefits (e.g., through additional revenue and costs saving) (EUR/year).
- No. of employees in new circular businesses.
- No. of jobs created in the circular economy.
- No. of procurement contracts including circular criteria (no. of contracts per year/expenditure per year, %).
- No. of companies or employees trained to adopt circular economy principles.
- No. of contracts awarded that include a circular economy criterion/Total no. of contracts.
- % of public investment dedicated to circular economy policy/Total public investment.

EVALUATION STRATEGY
Impact evaluation that will randomise participants, tracking participants' and control groups.

Evaluation will focus on understanding employment and circularity outcomes (i.e., whether participants secure employment and impact on at least 3 indicators in the circular economy reporting framework).

Data collection will start at recruitment, so it will be important for an evaluation lead to be designated at the start.

Participant companies will be tracked for 6 months after each initiatives finishes, including those companies which do not complete engagement in the initiative.

EXAMPLES OF SIMILAR CAPITAL INVESTMENTS

Circular food initiatives in other cities typically integrate with the existing enterprise support ecosystems and seek to build on food sector specialisms.

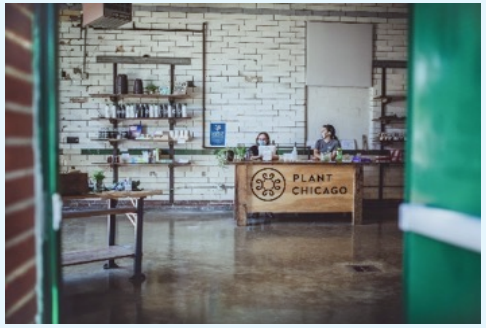
A common capital investment in circular economy food and hospitality initiatives is the development of hubs that provide incubator spaces for start-ups, commercial kitchens, R&D facilities, meeting spaces and hospitality spaces for the public.

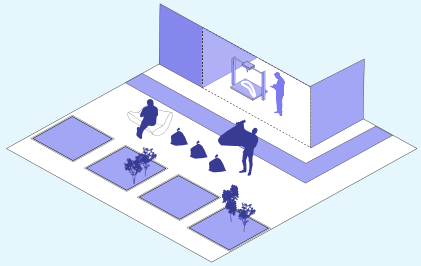
Some utilise existing buildings to create bespoke hubs within a city, while others co-locate with established multi-sectoral enterprise hubs. Two relevant examples are Spade - an incubator space in Dublin and the Plant - an incubator space with an anaerobic digestor in development based in Chicago.

INCUBATOR SPACE - PRODOCK (AMSTERDAM)



INCUBATOR SPACE - HOMEPORT (HAMBURG)



CONNECT

OVERVIEW & STRATEGIC FIT

The Connect option establishes a strategic Connected Circular Economy Hub organisation, as a partnership between Belfast City Council and Dublin City Council. This option does not require capital investment at the outset and focuses human resources on addressing the case for change and the needs identified, to:

- Target enterprise engagement to accelerate the transformation to a circular economy in Belfast and Dublin.
- Strengthen networks, coordination, collaboration across disparate circular economy initiatives that exist in and between both cities to expand the reach of existing initiatives, and deliver greater economies of scale.
- Address data gaps and establish a joint basis for data gathering and sharing within and between both cities with a view to increasing the circular material use rate between the cities (and potentially along the Dublin Belfast Economic Corridor), and developing the evidence-base for future connected circular economy investment.
- Identify barriers for new and existing enterprises in developing circular economy products and explore opportunities to address these barriers so that Belfast and Dublin can advance strategic aims for the circular economy, material flows, productivity, inclusive growth, and innovation.

Connect will also strengthen the capabilities of both City Councils to drive transformation towards the circular economy, putting them in a better position to align resources and enterprise supports across the wider circular economy ecosystems in Belfast and Dublin. Currently, the development of the circular economy is a small and occasional element of roles within each City Council that variously cross Enterprise Development, Climate Action, and Waste Management. Targeted resources are needed if the transition to the circular economy is to be achieved at the pace and scale required for Belfast and Dublin.

Through Connect, a pathway can also be established towards delivery of capital projects that tackle higher impact sectors, such as the development of material banks for the construction sector, as outlined under the HomeLab option, or the development of the infrastructure required for the food and hospitality sectors, as outlined under the Plate option.

Strategic Fit

Connect aligns with broader policy measures including The Waste (Circular Economy) (Amendment) Regulations (Northern Ireland) 2020 and the provisions, therein, to promote and support sustainable production. It also aligns with the objectives of Ireland's Circular Economy Strategy 2022-2023 to support and promote increased investment in the circular economy in Ireland; and to identifying the economic, regulatory, and social barriers to the development of the circular economy and the development of solutions.

The Connect option aligns to the evolving circular economy ecosystem in both cities and will ensure synergies between City Council Waste, Climate Change and Economic Development policies and targets.

The diversity of entrepreneurs in both cities, and potentially along the Dublin Belfast Economic Corridor, presents unique strategic opportunities to further connect to the cities while enabling the transition to a circular economy.

Although it is a ‘Do Minimum’ option, Connect scores highly in terms of feasibility and value for money.

Stakeholder engagement undertaken as part of this study (via the workshops in Belfast and Dublin and the Expert Advisory Group) identified that the fragmentation of existing circular economy ecosystems within each city – and the absence of connectivity between Belfast and Dublin in these respects – are significant barriers in transitioning to a circular economy.

This fragmentation leads to a lack of adoption in relation to innovation and new solutions, results in lost economic opportunities, and continues to enable linear economic models for enterprises that need to transition if they are to remain competitive in the circular economy.

Larger market exposure of the two cities working in collaboration could address some of these challenges and enable specialisation and complementarity that offer economies of scale for each city and jurisdiction.

OUTLINE APPROACH

Connect frames the opportunity for the circular economy in Belfast and Dublin across two levels of partnerships and programmes, which can drive a range of initiatives such as:

Partnerships

- Building strategic relationships within and between both City Councils.
- Advancing external stakeholder engagement around one or both sector-specific Emerging Preferred Options identified in this SAR/SOC (i.e., HomeLab or Plate).
- Engaging closely with regulatory agencies to address identified regulatory barriers.

Programmes

- Delivering dedicated programmes, such as circular economy challenge funds that provide seed finance to innovators developing solutions to connected circular economy challenges.
- Engaging with research programmes in Ireland and Northern Ireland to develop the evidence base on which both cities can make strategic decisions for the development of the circular economy.
- Participating in funding and capacity building networks and consortia at national and international level, and representing the Connected Circular Economy of Belfast and Dublin at national and international events.

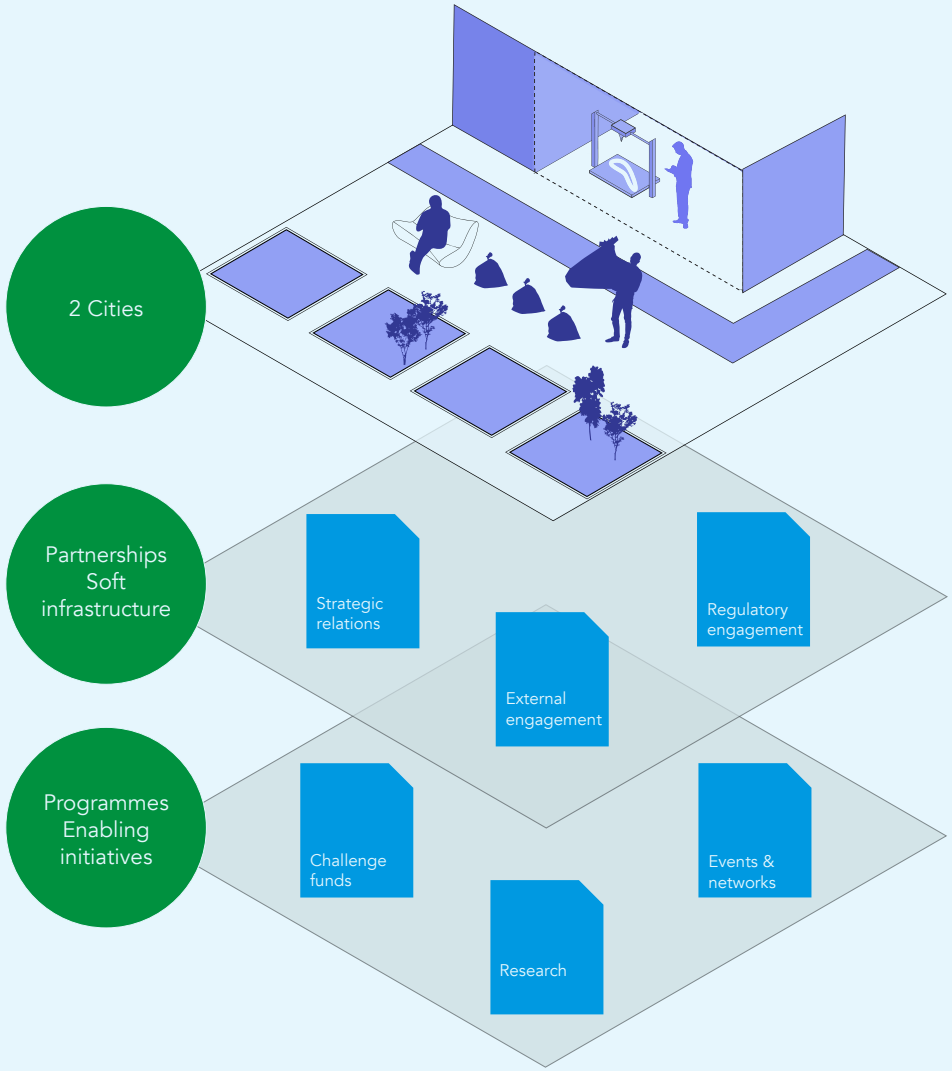


Figure 15: Outline Approach of Connect

DELIVERING THE APPROACH

Connect would operate with five staff; two based in Belfast, two based in Dublin and a CEO based in either Belfast or Dublin. The breakdown of staff would be as follows:

1 x Director / CEO

- Based in either Belfast or Dublin and working across both cities. The Director/CEO would drive the Connected Circular Economy Hub project at a strategic level, including a focus on strategic partnerships.

2 x Circular Economy Development Officers (CEDO)

- 1 x CEDO based in Belfast and 1 x CEDO based in Dublin. The CEDOs would lead on enterprise engagement and, where possible, each CEDO would bring specialist sectoral expertise that supports the capacity and capability of Connect to deliver with businesses.

1 x Project Manager – Funding & Finance

- Based in either Belfast or Dublin. The Project Manager for Funding & Finance would be focused on financial management, and on generating revenue, grants and sponsorship for programmes and projects being developed and delivered by Connect.

1 x Project Manager – Communications & Administration

- Based in either Belfast or Dublin. The Project Manager for Communications would lead on all communication and marketing for Connect, both online and offline, in addition to providing administrative support for Connect.

LOGIC MODEL

NEEDS AND CONTEXT
There are existing circular economy initiatives and enterprises across both cities. However, these require coordination and supporting infrastructure to scale to the level that is needed to achieve both city and national level targets.

POLICY CONTEXT
Belfast City Council and Dublin City Council Development plans, Climate Action/Net Zero Plans

Government of Ireland National Development Plan, Northern Ireland Circular Economy Strategy.

OPTION OBJECTIVES
Create a partnership connecting Belfast and Dublin City Councils focusing on scaling up initiatives to strengthen the circular economy ecosystems.

INPUTS
- Coordination & management team (co-located).
- Partnerships with businesses, regulators, HEIs, social economy.
- Research.

ACTIVITIES
- Programme delivery.
- Public events.
- Business events.

OUTPUTS
- New connected circular economy opportunities identified.
- Infrastructure developed.
- Regulatory barriers overcome.

IMPACTS
Objective 1 - New enterprise
Objective 2 - Existing enterprise
Objective 3 - Waste
Objective 4 - Innovation
Objective 5 - Net Zero

OUTCOMES
- Number of procurement contracts including circular criteria (no. of contracts per year/expenditure per year, %).
- Number of companies or employees trained to adopt circular economy principles.
- Number of contracts awarded that include a circular economy criterion/Total no. of contracts.
- Percentage of public investment dedicated to circular economy policy/Total public investment.

EVALUATION STRATEGY
Impact evaluation that will randomise participants, tracking participants' and control groups.

Evaluation will focus on understanding employment and circularity outcomes (i.e., whether participants secure employment and impact on at least 3 indicators in the circular economy reporting framework).

Data collection will start at recruitment, so it will be important for an evaluation lead to be designated at the start.

Participant companies will be tracked for 6 months after each initiatives finishes, including those companies which do not complete engagement in the initiative.


11

COST, AFFORDABILITY, AND RISK

11. COST, AFFORDABILITY, AND RISK

COST, AFFORDABILITY, AND RISK

This section of the SAR/SOC provides outline cost estimates for each of the Emerging Preferred Options, and initial considerations regarding affordability and possible sources of funding. The section also includes an initial assessment of key risks relating to delivery of the Connected Circular Economy Hubs.

Costs

In the context of a SAR/SOC, a high-level envelope of costs was put forward at the Multi-Criteria Analysis stage. This section offers outline cost estimates for the identified Emerging Preferred Options, namely:

- **RegenPorts** – Port-based hub.
- **HomeLab** – Circular construction.
- **Plate** – Food and hospitality sectors.
- **Connect** – Circular economy innovation and coordination.

For three of the options, RegenPorts, HomeLab and Plate, these preliminary estimates include an outline of capital costs (CAPEX) and operational costs (OPEX) for one year of operation. The Connect option has no associated capital costs and so the OPEX costs take account of rental costs based on market rates in Belfast and Dublin (Source: CBRENI/CBRE Dublin).

In the three options where capital investment is proposed, RegenPorts, HomeLab and Plate, the provision of enterprise space/managed workspace includes co-working/hotdesk space, reception, meeting rooms, a larger (70sqm) workshop/seminar space for collaborative events, office space for hub staff, kitchen for staff and tenants, along with ancillary facilities. These buildings are proposed as refurbishment of existing buildings, in line with circular economy principles. Where RegenPorts and Plate make provision for tenant companies with their own space in the buildings, HomeLab provides hotdesk/project space only, as HomeLab is more likely to work with construction enterprises offsite from the outset.

The Plate option also includes commercial kitchen/lab/food production space within the refurbished building. RegenPorts and HomeLab provide for warehouse space for Material Banks, initially at 500sqm, but with provision for an additional 500sqm in the detailed costings.

Connect provides office space for core staff with some provision for a meeting/collaboration space, along with ancillary facilities.

KEY ELEMENTS FOR EACH EMERGING PREFERRED OPTION PER CITY

Circular Economy Hubs – Outline Spatial Requirement per City	RegenPorts Sqm	HomeLab Sqm	Plate Sqm	Connect Sqm (Office Rental)
Key Elements				
Enterprise/Incubation/Hotdesk Space (incl. office for core hub staff)	1300	500	1250	70
Kitchen/Lab Spaces (estimated @ 10 x 50sqm spaces)	-	-	500	-
Warehousing/Material Banks*	500	500	-	-
Small scale Anaerobic Digestor Plant	-	-	50	-
Ancillary Elements				
External bike storage, parking, and basic landscaping	300	300	100	-
Service Yard for access to warehouse / material banks / kitchens	500	500	200	-
Staff (FTE) and Enterprise Numbers per City	**RegenPorts**	**HomeLab**	**Plate**	**Connect**
Total Core Staff across both hubs (Belfast and Dublin)	7	8.5	6.5	5
Core Staff per Hub	3 - 4	4 - 5	3 - 4	2 - 3
No. of Enterprises / Tenant Companies per hub	15	-	30	
No of People Employed in Tenant Companies per hub	75	-	90	
No of Additional Persons using co-working/hotdesk spaces per hub	20	15	-	

**Cost estimates in Annex 3 provide for cost of doubling of the initial 500sqm of Warehousing/Material Banks for RegenPorts and HomeLab.*

The outline costs for the Emerging Preferred Options are set out in the table below:

Project Outflows	RegenPorts	HomeLab	Plate	Connect
Estimate of Capital Expenditure (CAPEX) for Hubs in both Cities	Option 9	Option 6	Option 5	Option 2
Refurbishment of existing office space (incl. furniture)	5,200,000	2,000,000	10,500,000	-
Anaerobic Digestor Plant (New Build) Estimate	-	-	1,500,000	-
External bike storage, parking, and basic landscaping	300,000	300,000	100,000	-
New Build Warehousing / Storage (500sqm)*	1,750,000	1,750,000	-	-
Service Yard for access to warehouse / material banks	750,000	750,000	300,000	-
E/o Industrial Type Kitchens	-	-	540,000	-
Abnormal Cost Allowance	976,000	656,000	1,294,000	-
Design Development / Contingency	1,074,000	722,000	1,424,000	-
Development Fees & charges	1,180,000	794,000	1,566,000	-
Design Team Fees	1,476,000	992,000	1,958,000	-
1% for Public Art	118,000	80,000	158,000	-
Development Contingency	1,458,000	980,000	1,934,000	-
Total CAPEX (in Euros)	**€14,282,000**	**€9,024,000**	**€21,274,000**	**-**
Estimate of Annual Operating Expenses (OPEX) for both Hubs				
Core Staff costs**	612,454	743,694	568,707	437,467
Marketing costs	25,000	25,000	25,000	25,000
Programme Costs (Incubation/Innovation supports + Challenge Fund)	500,000	500,000	250,000	100,000
Utilities and electricity	171,120	111,600	133,920	5,208
Rental Costs (Office Rental for Connect)	-	-	-	56,680
Insurance Costs (Estimate)	30,000	20,000	20,000	3,500
Total OPEX per annum (in Euros)	**€1,338,574**	**€1,400, 594**	**€997,627**	**€627,855**
CAPEX + 1-year OPEX	**€15,620,574**	**€10,424,594**	**€22,271,627**	**€627,855**

**Cost estimates at Annex 3 provide for cost of doubling of the initial 500sqm of Warehousing/Material Banks for RegenPorts and HomeLab.*
***Staff costs for material banks for RegenPorts and HomeLab are not included at this stage of the SAR/SOC.*

AFFORDABILITY

This SAR/SOC study was funded under the Shared Island Fund. The Shared Island Fund was announced in the Government of Ireland's Budget 2021, with €500 million in capital funding available between 2021-25, ring-fenced for investment in collaborative North/South projects. The progression of Emerging Preferred Options arising from this study could be brought forward by Dublin City Council and Belfast City Council under the Shared Island Fund.

There are a range of other funding sources, in addition to the Shared Island, which may also be appropriate. These include:

Investor	Public or Private	Financial instrument	Relevance to a Connected Circular Economy	Example
Development Banks and Strategic Investment Funds	Public	Equity and debt	Strategic Investment funds and lenders such as the European Investment Bank or the UK Infrastructure Bank can offer a range of funds and flexibility on the size of investments they can make and the conditions for projects.	Co-financing under the UK Infrastructure Bank or Ireland's Strategic Investment Fund.
National and regional Governments	Public	Debt and grants	National and regional Governments could target investment at demonstrator/catalyst circular economy projects, but can also offer debt solutions to enterprises through various mechanisms.	UK/EU financing through Exchequer, Urban Regeneration and Development Fund, Climate Action Fund, Circular Economy Innovation Fund, Departmental budgets in line with Investment Strategy for Northern Ireland and the National Development Plan for Ireland, and Enterprise Development Funding.
Local Authorities	Public	Debt and grants	Local Authorities have less access to capital to offer as grants or debt-financing, but they can establish synergies with local projects offering to reduce costs or improve local services. This can lead to either small grants being disbursed or to debt solutions being deployed.	Enterprise grants.

Private Banks	Private	Mostly debt	Private banks can provide debt-financing to projects having already built a minimum viable product and/or a pilot. Investment size may vary but ideally it would target projects of €10M+	Project finance, Revolving Credit Facilites.
Impact investment Funds	Private	Equity and debt	Impact funds provide both debt-financing and equity and can provide very early-stage financing through an angel-investor setup. Typically targeting small projects (<€5M)	Impact-Linked Loans.
Green Infrastructure Funds	Private	Equity and debt	These funds target infrastructural projects. Typically targeting medium sized projects (€10-20M)	Green and Sustainable Loans.
Corporate investors	Private	Mostly equity	Generally interested in either acquiring a business or providing support. In acquisitions, typically targeting equity even in relatively small amounts (starting at €1M) and in support typically offering small innovation grants.	Equity-to-debt Convertible Options.
Philanthropies	Public and/or private	Grants and/or concessional debt	Generally, a specific impact rationale delivering significant grant capital or concessional debt solutions to be repaid at advantageous conditions.	Impact-linked Loans.
Alternative funds	Public and/or private		Alternative forms of funding such as crowdfunding or leasing.	Project finance.

PRELIMINARY ECONOMIC IMPACTS

A preliminary assessment of the direct economic impact arising from the four Emerging Preferred Options has been developed based on the potential number of full-time equivalent (FTE) jobs that could be created when the occupancy of each of the four Emerging Preferred Options is at 'full capacity'.

From this starting point, the study estimates average annual earnings of the jobs arising from full capacity, with gross value added (GVA) based on an approximation of GVA per FTE taken from official statistical sources. This has been calculated at a sectoral level, focused on employment in two key sectors:

- Professional, scientific, and technical activities, for the enterprises/desk space created
- Administrative and support service activities, for the core staff who will manage the spaces and deliver the programmes of the Connected Circular Economy Hubs described under each option.

The sources for these estimates are as follows:

Data	Northern Ireland Source	Ireland Source
Annual Average Full-Time Earnings	Annual Survey of Hours and Earnings (ASHE) – NISRA Year: 2022	Earnings Hours and Employment Costs Survey – CSO Year: 2022
Gross Value Added (GVA)	Regional gross value added (balanced) by industry: all ITL regions – ONS Year: 2021	Productivity in Ireland, GVA Indicators – CSO Year: 2020

Based on the above data sources, the Average Annual Full-time Earnings for the Belfast and Dublin Hubs are as follows:

Preliminary Estimates of Direct Economic Impact of Emerging Preferred Options

Belfast	RegenPorts	HomeLab	Plate	Connect
Average Annual Earnings per NISRA data				
Core Staff	£97,998	£118,998	£90,998	£69,999
Enterprise jobs at full capacity	£2,601,975	-	£3,122,370	-
Hot-desking at full capacity	£373,297	£279,973	-	-
Total Annual Wages at Full Capacity	**£3,073,270**	**£398,970**	**£3,213,368**	**£69,999**

Dublin	RegenPorts	HomeLab	Plate	Connect
Average Annual Earnings per CSO data				
Core Staff	€147,970	€179,677	€137,400	€105,693
Enterprise Jobs at full capacity	€4,534,275	-	€5,441,130	-
Hotdesking at full capacity	€650,517	€487,888	-	-
Total Annual Wages at Full Capacity	**€5,332,762**	**€667,565**	**€5,578,530**	**€105,693**

*Although based on the same job numbers as set out for each of the Emerging Preferred Options (per p.135), the annual average earnings figures set out in this table, above, use a conservative estimate of average salaries, based on the official NISRA/CSO data. These figures do not include employer costs. Higher salary estimates have been used to determine the operating expenditure (OPEX) costs, previously outlined. The core staff costs set out within the earlier OPEX costs also include estimated employer cost.

In terms of earnings, an average has been used in line with these official statistical sources. However, these salary figures are conservative and likely to be an underestimate given the high calibre of the jobs anticipated to be created through the Connected Circular Economy Hubs. Higher salary estimates have been used to determine the operating expenditure (OPEX) costs, previously outlined. GVA from construction costs, staff for material banks (RegenPorts/HomeLab) and indirect or induced economic impacts are not estimated at this stage of the process. The estimated impact for each city is set out in the tables below:

Preliminary Estimates of Direct Economic Impact of Emerging Preferred Options

Belfast	RegenPorts	HomeLab	Plate	Connect
Gross Value Added – full operating year				
Core Staff	£119,308	£144,874	£110,786	£85,220
Enterprise jobs at full capacity	£3,682,806	-	£4,419,367	-
Hot-desking at full capacity	£528,360	£396,270	-	-
Total Annual Wages at Full Capacity	**£4,330,474**	**£541,144**	**£4,530,153**	**£85,220**

Dublin	RegenPorts	HomeLab	Plate	Connect
Gross Value Added – full operating year*				
Core Staff	€589,949	€716,366	€547,810	€421,392
Enterprise jobs at full capacity	€6,387,773	-	€7,665,328	-
Hot-desking at full capacity	€916,433	€687,324	-	-
Total Annual Wages at Full Capacity	**€7,894,155**	**€1,403,691**	**€8,213,137**	**€421,392**

*Republic of Ireland figures have been revised downwards by 45% for GVA and 10% for FTE jobs in order to limit potential FDI distortions. This approach takes account of evidence within a recent ESRI paper "Modelling productivity levels in Ireland and Northern Ireland', 2022 and reflects engagement with ESRI on the matter.

RISKS

An initial qualitative high-level risk analysis has been undertaken identifying risks that, at this stage, are largely common to each of the Emerging Preferred Options. The analysis notes associated mitigations which will benefit from review and refinement in the development of the Final Business Case.

In addition, several option-specific risks have been identified for each of the four Emerging Preferred Options, which should be considered further as the assessment of final options develops.

The high-level risk analysis focuses on the following broad categories:

- Strategic
- Project Construction/Implementation
- Operational
- Environmental
- Option-specific

Strategic	
Risk	**Mitigation**
Ability to meet multiple strategic and operational objectives particularly in terms of dependencies at all levels including strategic dependencies such as City Council relationships.	Strategic status mandate and objectives should be clear and firmly established at the outset with clear outputs and outcomes identified and reviewed on an ongoing basis through project implementation and delivery.
Potential for political and/or public interest given the focus on environmental issues. There may be a high degree of interest from environmental organisations and media.	Appoint a stakeholder engagement lead. Carry out sufficient early-stage consultation.

Capital Build	
Risk	**Mitigation**
Cost escalation and delays either through internal issues (e.g., project management, changing brief/scope, site specific issues) or external issues (e.g., supply chains, inflation, currency, geopolitical). For example, schedules may be challenging, and key deadlines may be missed. Budgets may move outside organisational spend delegations for various reasons and become significant relative to the benefits of the actual option delivery.	Implementation of a thorough costing model with sensitivity analysis built in and a robust contingency process in place. Implementation of clear and well-structured project management frameworks, taking on board guidance from Capital Works Management Frameworks, and from Construction and Procurement Directorate.
The design cannot deliver services to required quality standards.	Define and agree minimum quality standards for the project to be included as a commitment in the contract terms and fully costed in the costing model.
The ability to meet the project brief to high quality standards necessary including high ESG standards.	The procurement process ensures the high-quality delivery of the project, focusing on track record, expertise and access to appropriately skilled resources. Have stringent quality control procedures, effective oversight, and effective site supervision/monitoring in place.

Gaining planning and statutory consent depending on the scale and complexity of the project and its location could be a significant risk factor, particularly where the option involves a more innovative intervention.	Prepare and implement a stakeholder engagement plan early in preparation of the Full/ Final Business Case to influence strategy development with relevant engagement and pre-app/ scoping/ screening. Identify further proportionate environmental assessment work, project risks, mitigation requirements and opportunities to inform the cost plan, programme, and design (engagement to include key stakeholders, organisations, landowners, user groups, and others).
That funding can be secured and there is surety regarding the approved uses, administration, and accountability requirements for this funding. This is particularly important where there are cross-organisational fundings arrangements with complex financial controls/reporting, and ensuring clarity around which stakeholders are contributing support to which aspect of the project. The extent of financial exposure of public funds, or additional financial burden should be reviewed in the context of a detailed understanding of the project costings and contingencies built in to support any capital build.	Consider all funding options, both internal and external to the project promoters. Seek early engagement with funding bodies and partners and ensure clear and agreed protocols are documented and signed-off prior to project commencement. Develop detailed and robust financial modelling/controls and maximise potential for efficiencies including circular solutions.

Operational	
Risk	**Mitigation**
Access to a fully resourced, skilled, and stable core team.	Governance oversight plan developed by City Council stakeholders. Strong governance framework and oversight of project. Recruitment process focused on core staff with direct experience in the sectors relevant to the identified preferred option, including expertise in enterprise engagement.
The overall risk that the demand for the service does not match the levels planned, projected, or assumed. As the demand for a service may be partially controllable by the public body concerned, the risk to the public sector may be less than perceived by the private sector.	Detailed demand analysis undertaken to gather information on the demand for services (existing and new/emerging business) for relevant sectors/options. Business plan commissioned to set out goals and plans for achieving them. Understanding the impact depending on the delivery lead i.e., public, quasi-public, public-private partnership, private sector.
Inability to attract emerging/new circular economy businesses including the extent of entrepreneurial culture and degree of entrepreneurial sophistication of the start-up/growth community to identify and develop circular concepts and to test and bring to market. Also, the support ecosystem (e.g., financing) to support new projects or businesses is a potential risk.	As per above on demand analysis. Liaison with key stakeholders including Government officials and relevant state agencies, economic development bodies, banks, and other lending institutions to understand the support environment in place. Identify key existing circular economy ecosystem stakeholders in each city, their role in enterprise engagement, and their role in supporting the transition to a circular economy. These stakeholders should include relevant enterprise partners and hubs, as well as research and innovation organisations.

Risks to ongoing viability of the hubs, including financial exposure of public funds, or additional financial burden, for different aspects of performance of the project. This is particularly important at the early stages of developing the hubs.	Detailed financial plan to determine sustainability and model scenarios based on evidence including demand analysis. Clarity around funding/financing packages and the assignation of clear roles and responsibilities, including for operational viability.
Ongoing stakeholder and funder commitment to the hubs, considering changing strategic priorities or funding commitments. This links to the dependencies developed between City Councils to support the interconnectedness of the hubs and the extent to which the hubs they are exposed or dependent on those commitments.	Formal governance and reporting structures in place. Regular joint meetings between City Council (and wider) stakeholders with reporting from the hubs on performance, finances, challenges, and opportunities.
Different regulatory regimes regarding by-products, end-of-waste criteria and other circular economy related regulations leading to approval delays and increased compliance costs for enterprises operating within a connected circular economy.	Ensure close working relationships with regulatory agencies such as the EPA, DAERA, Environment Agency and newly formed Office for Environmental Protection.
Displacement , where there are already initiatives in place and/or underway that may replicate aspects of a relevant option.	Identification and structured ongoing engagement with relevant stakeholders in Belfast and Dublin delivering and/or financing circular projects.

Environmental	
Risk	**Mitigation**
Impacts on biodiversity and ecosystems. There is a risk that the project has a major impact on an adjacent area. Such a risk may also be linked to a strong likelihood of objection to the project from the public.	Embed Environmental Impact Assessment. Define environmental impact targets for construction and operational aspects of project.
Increased greenhouse gas emissions-pollution and unsustainable use of natural resources.	As above
Failing to achieve policy and regulatory targets/requirements – for example, net zero and Paris Agreement..	As above

There are potential risks that are unique to each of the four Emerging Preferred Options. Potential high level risks are noted as follows.

RegenPorts - Port-based Hub	
Risk	**Mitigation**
Challenging property/construction environment e.g., Fewer options for refurbishment/development; high levels of underground cabling in ports.	Procurement of a design team with relevant experience in designing projects within ports or similar infrastructures.
Interfaces between delivery entities or contracts Risks from the contractual arrangements between parties.	Build on existing contractual arrangements between ports and cities for co-delivery of infrastructure.
Existing asset conditions The risk that the costs of keeping the assets in good condition vary from budget.	Apply standard selective refurbishment guidelines and available guidelines on retrofitting older buildings. Assign an advisory panel with expertise on refurbishment and upgrades to existing buildings. Develop structured maintenance and service programmes for the facilities and update these as required.

HomeLab - Circular Construction	
Risk	**Mitigation**
Systems integration The risk that key systems are not possible to integrate e.g., data interoperability between the two City Councils.	Ensure that the data models are developed using an agreed Open Data Technical Framework using a 5-star deployment scheme for Open Data and adhering to international standards defined by reputable standards organisations, such as ISO, the European Commission, W3C, IETF, OGC and OASIS.
Coordination Coordination across the policy context of the broader enterprise and supply chain.	Ensure that the delivery of the option aligns to existing models of housing delivery and does not undermine existing structures. Where external delivery bodies are involved (e.g., approved housing bodies), ensure that national guidelines relating to these bodies are adhered to.
Wider economic impacts Economic uncertainty leading to a contraction in the construction sector, leading to a reduced need for the initiative in short to medium term – whether as a result of inflation, exchange rates, commodity prices and availability of labour.	Ensure programmatic flexibility to allow for adjustments to delivering HomeLab initiatives and supports in line with housing delivery.

Plate - Food and hospitality sectors	
Risk	**Mitigation**
Funding availability The risk that the availability of funding leads to delays and reductions in scope e.g., managed workspaces and anaerobic digestor.	The funding strategy will be based on diversified income and inflows from multiple sources. This funding strategy will allow for scaling over time.
Consentability Delay to obtaining consents and approvals for the anaerobic digestor.	Ensure that delivery is not contingent on operation of an anaerobic digestor and that timeframes for planning consents are factored into financial modelling.
Economic uncertainty Commercial and supply chain management (insolvency risks, performance issues) leading to low tenant uptake or retention.	Ensure close cooperation and collaboration with the wider enterprise support ecosystem, particularly in the food and hospitality sectors, so that a suite of enterprise supports can be made available.
Health and Safety as a barrier to Engagement The risk that health and safety concerns prevents broad open use of the commercial kitchens, particularly for community groups.	Develop, implement and monitor best-practice health and safety practices for community kitchens and teaching environments.

Connect - Circular economy innovation and coordination	
Risk	**Mitigation**
Lack of clear agreed functional requirements There are risks arising from a lack of clear agreed functional requirements between both City Councils, leading to a service that is not fit for purpose or not integrated.	The delivery of this option will involve oversight from the Connected Circular Economy Hub teams in both City Councils. This will ensure institutional memory of the SAR/SOC process. The governance structure for this option will ensure active and ongoing collaboration between both City Councils while ensuring alignment with different reporting structures within each organisation.
Operational readiness There is a risk that key partners are not ready operationally e.g., targeting of staffing resources in both City Councils; availability of appropriately skilled staff..	The proposed staffing structure will provide the initial staffing requirements for delivery of this option. A cross functional team will be established between both City Councils with a view to building capacity and capabilities required.
Operational risk The risk that as the option scales, the necessary operating costs vary from budget.	The governance structure for this option will ensure effective financial oversight. It will also enable agility in accessing finance to meet operational demands.


12

PROJECT APPRAISAL PLAN

12. PROJECT APPRAISAL PLAN

This Appraisal Plan is based on the guidelines of the Public Spending Code within the SAR stage of the Business Plan process. The Appraisal Plan sets out at an early stage in the process, the proposed methodologies to various appraisals that are necessary to support the development of the Project at both Preliminary Business Case and Full/ Final Business Case stage.

This includes the proposed methodology for:

- Deriving a shortlist from the longlist of options.
- Financial appraisal.
- Economic appraisal.
- Sensitivity and scenario analysis.
- Factoring risk and optimism bias.

It should incorporate the rationale for the appraisal methodology, including the methodology to be used as part of the economic appraisal. This includes the use of cost benefits analysis (CBA), Multi-Criteria Analysis (MCA) and quantitative and qualitative analysis to measure and report on impact assessment.

The Connected Circular Economy Hubs project is complex in that, unlike a 'standard' SAR, the long and shortlist options have been developed with no physical, conceptual, or financial context in place. However, a robust approach to the development and appraisal of options has been developed, including longlisting and shortlisting, as well as an assessment of qualitative (non-monetary) factors and potential risks associated with each option.

The appraisals at each stage will be based on evidence developed and gathered from research and stakeholder engagement. The approach will result in the identification of a preferred option alongside a preferred commercial delivery route, with a clear view on the project financial implications and affordability.

Figure 16: Methodology for Project Appraisal

Figure 16, outlines this proposed methodology for appraisal of the project, from longlist option identification through to Final Business Case Report stage:

DERIVING A SHORTLIST FROM THE LONGLIST OF OPTIONS

A longlist was developed identifying options that are capable in various capacities of meeting the project objectives. They were developed through extensive desk-based research to understand national/international approaches and exemplars as well as extensive consultation with both City Councils, the Expert Advisory Group, and a range of external stakeholders. Once developed and agreed, the approach is to sift through these options using the project objectives as the basis to apply an MCA framework (see Section 9). This process identified the options which achieve the best outcomes in terms of the project objectives and identified where there are constraints.

The MCA provides criteria tailored specifically to the Connected Circular Economy Hubs project which supports transparency in decision making, supports stakeholder engagement and provides a means through which non-quantitative factors can be assessed.

This identifies a shortlist of Emerging Preferred Options which can be brought forward for more detailed appraisal to augment what has been developed within this SAR/SOC. This will include both quantitative and qualitative (non-monetary) assessment to support the economic appraisal.

It is recommended that at least three options should be included at the detailed appraisal stage along with a ‘do minimum’ option.

FINANCIAL APPRAISAL

The financial appraisal sets out the potential costs and financial prerequisites of the project options with a particular focus on costs to Government. It looks at pre-finance cashflows to establish the preferred option along with how it will be delivered and financed. This includes a forecast of exchequer cash inflows and outflows for each of the shortlisted options that includes all associated annualised inflows and outflows as well as, for example, capital investment costs, and operational costs including labour and tax amongst other costs.

While there is no requirement to present a preliminary assessment of the financial and commercial appraisal of options in the SAR/SOC framework, initial considerations have been explored within this report, taking account of the limited information available, particularly around site, scale, and funding options. This will then be taken forward in more detail in the next phase of developing the Full/Final Business Case to set out cashflow and affordability focused on a range of potential delivery options with a clear statement around the preferred commercial option.

This should include a dedicated statement on the affordability in terms of funding sources, including forecast affordability/sustainability.

ECONOMIC APPRAISAL

A preliminary Cost Benefit Analysis approach is considered feasible at this stage in the business case process, given the constraints of the options development process to consider the economic impact of the shortlisted options.

This economic appraisal will seek to identify the economic impact of the shortlisted options in Gross Value Added (GVA) terms when operating at full capacity and compare this to the forecast costs associated with the delivery of the project. This is to estimate a 'break even' approach to Benefit : Cost Ratio for each option, for example how many years of full operation would it take to make the GVA impact equal to the capital investment costs of the options.

It will also consider the wages impact of each option in terms of the value that those jobs, assumed additional at this point in the planning process, bring to the local economy. This is calculated at a sectoral level focusing on the key metrics of GVA per full-time equivalent and full-time gross annual earnings.

These metrics are considered acceptable at this point given that more detailed operational information is not available without, for example, location, site and scale detail. In the next phase additional metrics could be considered including research activity, R&D spill overs and Cluster/Agglomeration effects.

There are also non-monetary benefits, particularly in relation to circular/environmental objectives which do not necessarily lend themselves to quantification. These have been considered for the longlist options through the MCA process.

Capital costs associated with the options and operational costs associated with delivery will also be assessed. Each option will be ranked based on this assessment of costs and benefits. This will be combined with the qualitative assessment of options to identify a preferred option, based on the balance of the quantitative and qualitative appraisal of options.

SENSITIVITY AND SCENARIO ANALYSIS

During the financial appraisal of the preferred option, key sensitivities are tested against a range of factors that could materially impact on the delivery of the project within the budget/funding envelope both at investment and operational stage.

At the investment stage this could include, for example, construction cost inflation, professional fees escalation and cost of finance. From an operational perspective this could include demand and phasing with subsequent impact on revenue/ income. Sensitivities can be assessed as high, medium, or low.

FACTORING RISK AND OPTIMISM BIAS

Delivery risk is a significant issue, particularly with an innovative and potentially complex project such as this. Among the considerations under this heading are planning, design, environmental, procurement and demand risk. This report notes some of these risks in broad terms, but a more thorough risk assessment will be required in the process of delivering a Full/Final Business Case. Full implementation of the relevant public spending guidelines will mitigate project risk. In addition, the identification of key risks at an early stage of the project will be critical to successful management and mitigation.

A risk analysis was carried out outlining key risks, and proposed mitigation measures. This will be a live document which means there will be ongoing identification and monitoring of risks throughout the project.

The risk analysis will be updated should changes and alterations of project scope, schedule and cost estimates occur. The approach will be consistent with governance and risk management frameworks of both City Councils and project funders.

Optimism Bias reflects the propensity for project promoters to overestimate benefits (e.g., demand for units) and underestimate, for example, costs and delivery timelines (capital and operational).

Optimism bias will be outlined and documented at the outset for the preferred option. This will be considered and applied at all stages of project delivery.


13

OUTLINE GOVERNANCE PLAN

13. OUTLINE GOVERNANCE PLAN

OUTLINE GOVERNANCE APPROACH

There is no 'one size fits all' governance design for the Emerging Preferred Options. The approach needs to underpin the shared ambition of Belfast City Council and Dublin City Council to develop Connected Circular Economy (CCE) Hubs, while respecting the governance and reporting requirements for each City Council.

As the project proceeds to final business case, the governance frameworks will be further detailed. These frameworks will need to encompass:

- The development of physical infrastructure (where required) for the Connected Circular Economy Hubs.
- The establishment, management, and related oversight of Connected Circular Economy Hub operations in both cities.

These elements should be addressed through an integrated approach to ensure that delivery on capital is aligned to operational needs. Figure 17 (opposite) sets out a possible integrated governance framework for the Connected Circular Economy Hubs.

At the top level, it recognises the independence of each City Council. Reporting to each City Council is a Joint Oversight Board comprising the Chief Executives of both City Councils. Reporting to the Oversight Board is a Joint CCE Strategy & Operations Group (Level 3 in Fig.17) co-chaired by Directors from each City Council. Separate Capital Project Boards will be established to ensure that assurance provided to each City Council through the Oversight Board is in line with the appropriate governance frameworks for public sector capital investment in each jurisdiction.

The separation of the Capital Project Boards (Level 4) will ensure that there is no transfer of risks between capital projects, while their integration through the Joint CCE Strategy & Operations Group can ensure joint oversight, shared learnings, and appropriate consideration of operational needs.

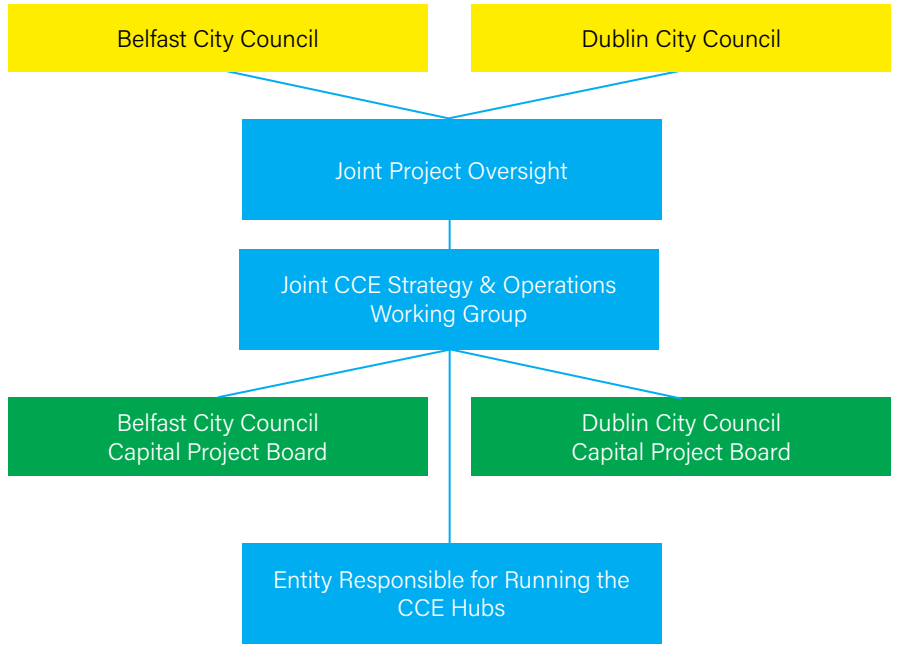


Figure 17: Integrated Governance Framework

Governance arrangements will also have to be designed to take account of third-party reporting requirements relating to funding for the Connected Circular Economy Hubs, and whether such reporting requirements are, for example, met by the Joint Project Oversight Board or by the respective City Councils.

Clarity will also be required in relation to ownership of capital facilities developed in each city and any lien on the property relating to external funding.

When the capital projects are completed, documented, accounted for, and handed over, the Capital Project Boards can be dissolved.

The Joint CCE Strategy & Operations Group will also be responsible for establishment of the entity with responsibility for operating the Connected Circular Economy Hubs (Level 5). If these hubs are to deliver on a connected circular economy approach between the two cities, a joint management entity should be agreed in the development of the final business case.

Several approaches could be adopted in relation to this joint management entity, such as:

- Employment of staff directly by one City Council with a Director/Head of Connected Circular Economy Hubs reporting to the Joint Strategy & Operations Group and staff allocated to the section of each City Council relevant to the preferred option.
- Procurement of an entity or consortium to run the Connected Circular Economy Hubs, e.g., existing enterprise/ innovation hubs or innovation centres anchored in higher education institutions.
- Employment of staff under an existing partnership entity, such as Dublin-Belfast Economic Corridor, with a view to longterm growth of the hub and its programmes along the corridor.
- Establish a company limited by guarantee, or designated activity company, bringing relevant stakeholders and external expertise onto the board.
- A public-private partnership could be established. This option could also be considered where the final business case determines that private sector investment and expertise is central to the development or operation of the hubs. In such a scenario, public investment may be required to de-risk the project, or elements thereof, for private sector investment to come on board.

The lessons learned section sets out different models for the operation of Circular Economy Hubs.

The optimal approach will depend on the scale, complexity, and specific requirements of the final preferred option. Regardless of the preferred approach to joint management, consideration should be given to including external expertise at board/working group level as the project develops.

ANNEXES

ANNEX 1

EXPERT ADVISORY GROUP

An Expert Advisory Group was set up to advise and inform the Connected Circular Economy Hubs project. Experts from a range of related specialist areas were invited to join the group.

The members of the Expert Advisory Group were:

- Brenda Burke - Circular Economy, Advanced Manufacturing and Agri-Tech Division, Department for the Economy, Northern Ireland.
- Ross Curley - Head of Economic Development Acting, Dublin City Council.
- Claire Downey - Policy and Research Director, Rediscovery Centre, National Centre for the Circular Economy.
- Anthony Flynn – Assistant Chief Executive Acting, Dublin City Council.
- Eimear Montague - Executive Director, Northern Ireland Resources Network (NIRN), an organisation working with third sector organisations and local authorities to promote sustainable reuse and repair and the transition to a Circular Economy in Northern Ireland.
- Professor Michael A Morris - School of Chemistry, Trinity College Dublin, and Director of AMBER, the SFI Research Centre for Advanced Materials and Bioengineering Research, Trinity College Dublin.
- Heidi Redmond - Circular Economy Adviser, Strategic Investment Board Northern Ireland.
- Dr. Joanne O'Rourke - Resource Efficiency Officer, Dublin City Council.
- Keenan Stack - Transport, Infrastructure & Environment Policy Executive, IBEC.

The Group met four times over the course of the project.

They provided valuable input and advice at key stages of the project and their contribution is much appreciated.

Members of the Expert Advisory Group also attended the stakeholder workshops in Belfast and Dublin.

ANNEX 2

OVERVIEW OF STAKEHOLDER WORKSHOPS

Stakeholder workshops were held in Dublin and Belfast on the following dates.

- **Workshop 1 - Belfast City on July 5th, 2023 (20 attendees)**
- **Workshop 2 - Dublin City on July 17th, 2023 (25 attendees)**

Participants represented a range of organisations, including Government departments and agencies, local authorities, business and social enterprise representative organisations, higher education, social economy, environmental and community groups.

Organisations at the Workshops

- Belfast City Council (Enterprise, Climate, Innovation).
- Belfast Harbour.
- Belfast Repair Café.
- Business in the Community NI.
- CIRCULÉIRE/Irish Manufacturing Research.
- Chartered Institute of Housing.
- Department for Economy NI.
- DogPatch Labs.
- Dublin Belfast Economic Corridor.
- Dublin City Council (Enterprise, Climate, Active Travel, Arts).
- Dublin City University.
- Dublin Regional Enterprise Plan.
- Dublin Town (Business Improvement District).
- Earthshine.
- East Belfast Mission.
- Eastern and Midland Regional Assembly.
- Eastern Midlands Regional Waste Office .
- Enterprise Ireland.
- Environmental Protection Agency.
- Federation of Small Businesses.
- Guinness Enterprise Centre .
- IBEC.
- InterTrade Ireland.
- Invest NI.
- Irish Bioeconomy Foundation.
- Irish Green Building Council.
- Irish Manufacturing Research.
- Local Enterprise Office Dublin City
- Manufacturing NI.
- Northern Ireland Food & Drink.
- Northern Ireland Resources Network.
- Queen's University Belfast Advanced Manufacturing Innovation Centre.
- Revolution Farm and Kitchen.
- Royal Society of Ulster Architects.
- Social Farms and Gardens.
- SPADE.
- Strategic Investment Board NI.
- The Rediscovery Centre.
- Tog Hacker Space.
- University of Ulster.

Pre-Workshop Participant Survey

In advance of each workshop, a survey was shared with invited participants to gather initial insights into their existing understanding about the circular economy, any initiatives that organisations were involved in and the themes these addressed.

Workshop Overview

Following a Q&A session, participants were then divided into four breakout tables to explore key questions and topics. The four topics were based on the EU taxonomy for sustainable activities that support the transition to a circular economy:

Each table then gave feedback to the wider group and the findings were

discussed. The key questions addressed by each table were:

- What gaps and opportunities can a Connected Circular Economy address?
- What new skills, knowledge, competencies are required for a Connected Circular Economy?
- What are the key enablers of a Connected Circular Economy?
- What existing and new capacities, knowledge, or skills should be utilised or developed?
- What impacts should a Connected Circular Economy aim for?
- What examples of cross border initiatives can we learn from?
- What are the key opportunities of a Connected Circular Economy between Dublin and Belfast?

ANNEX 3 – COST REPORT

Notional Cost Estimate - Rev B

Connected Circular Economy

Between Dublin and Belfast

24th October 2023

DOCUMENT CONTROL

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Revision	Date	Prepared	Checked	Approved
Draft Notional Cost Estimate	13.10.23	SC	BS	BS
Draft Notional Cost Estimate - Rev A	19.10.23	SC	BS	BS
Draft Notional Cost Estimate - Rev B	24.10.23	SC	BS	BS

Notional Cost Estimate - Rev B
Connected Circular Economy
Between Dublin and Belfast
24th October 2023

Index

1.0 Notes & Clarifications

1 This Notional Cost Estimate has been based on an outline briefing document provided by M-CO on 9th October 2023.

2 There are 4nr different Building types provided for in the M-Co briefing document "Connect", "Homelab", "Plate" and "RegenPorts".

3 "Connect" - Is noted as a 3 Person Office Space, however this has been excluded from this Notional Cost Estimate on the confirmation that MCO are investigating rental options for this type of building/hub.

4 "Homelab" is split into two sections - one section is based on the refurbishment of an existing office space to create a physical office hub, and the second section is the creation of new build ancillary warehousing/material bank building and service yard within each city.

5 "Plate" is split into two sections - one section is based on the refurb option for providing R&D labs and production kitchens for startup companies within the food and bioeconomy industry, and the second section is based on the creation of an Anaerobic Digestor Plant.

6 "RegenPorts" is split into two sections - one section is based on the refurbishment of an existing office space to create a physical office hub, and the second section is the creation of new build ancillary warehousing/material bank and service yard within each city.

7 In the absence of layout drawings and specific locations for these proposed buildings/works, the costs included in the attached report are notional and high level and will need to be reviewed and updated once further clarification has been provided and the scope of works has been developed in more detail.

8 For the purposes of this report we are carrying the following allowances:

9 10% for Abnormal Costs, 10% for Design Development, 10% for Development fees and charges, 12.5% for design fees, 1% for artwork, 10% for development contingency.

10 The list of allowances above will need to be developed and refined once the scope is developed.

11 Please note that the costs are notional and high level at this point in time. At this level of estimation, the variance in construction costs and fees between Dublin and Belfast are not considered to be significantly material to the high level costs outlined. The overall costs have therefore been estimated in Euro and are based on current construction costs in Dublin, with a currency conversion factor of 0.86 (EUR to GBP) applied to propose the approximate cost for the works relating to the specific projects in Belfast. This figure is estimated based on the current currency conversion rate and will be subject to further change with future currency fluctuations. More detailed cost estimates should be applied to relevant options specific to each city and location prior to determination on a final business case.

12 Please refer to our list of exclusions noted in this document for more details.

13 Please note VAT is currently excluded from the costs contained in this document and will be subject to the applicable levels within each jurisdiction - Ireland currently 13.5% and 23%, Northern Ireland currently 20%. All VAT is subject to the tax status of Employing party and the applicable jurisdiction where the works occur.

Notional Cost Estimate - Rev B
Connected Circular Economy
Between Dublin and Belfast
24th October 2023

3.0 Overall General Summary

	Description	Dublin	Belfast (Currency Conversion Factor of 0.86)	Assumed Building Size
		€ EUR	£ GBP	m2
(1)	"Connect" (City Centre Office Space for 3 people) - MCO to review Rental Options	Excl.	Excl.	Excl.
(2)	"Homelab"	5,387,000	4,632,820	500
(3)	"Plate"	10,637,000	9,147,820	500
(4)	"RegenPort"	8,016,000	6,893,760	1,300
	Total Notional Cost Estimate (Excl. VAT)	**€24,040,000**	**£20,674,400**	

"Homelab" - Cost Summary

Item	GIFA / m2		Cost Range € / m2	Cost / Sq.m. € / m2	Total Dublin (Excl. VAT) € EUR	Total Belfast (Excl. VAT) £ GBP
1. Enabling Works (Site Infrastructure/Preparatory Works)						
Demolition of existing buildings	Excl.	Excl.	Excl.	Excl.	Excl.	Excl.
Site strip, preparation, preparatory earthworks etc.	Excl.	Excl.	Excl.	Excl.	Excl.	Excl.
Works to Neighbouring properties	Excl.	Excl.	Excl.	Excl.	Excl.	Excl.
2. "Homelab" (Office/Managed Workspace - City Centre)						
Refurbishment of existing office space (incl furniture)	500	m2	€1,500 - €2,500	2,000	1,000,000	860,000
External Bike storage, parking and basic landscaping	300	m2	€250 - €750	500	150,000	129,000
3. "Homelab" (Warehousing / Material Banks - Edge of City)						
New Build Warehousing / Storage	500	m2	€1,500 - €2,000	1,750	875,000	752,500
E/o for additional warehouse / Material bank (Option)	500	m2	€1,500 - €2,000	1,750	875,000	752,500
Service Yard for access to warehouse / Material banks	500	m2	€500 - €1,000	750	375,000	322,500
Works Outside Site Boundary:						
- Siteworks outside Site Boundary	Excl.	Excl.	Excl.	Excl.	Excl.	Excl.
Preliminaries & Insurances:						
- Preliminaries & Insurances	1	item			Incl.	Incl.
- Bond	1	item			Incl.	Incl.
Abnormal Cost:						
- Abnormal Cost Allowance (assumed 10%)	10	%			328,000	282,080
Design Development:						
- Design Development / Contingency (assumed 10%)	10	%			361,000	310,460
Inflation:						
- Allowance for future inflation	Excl.	Excl.	Excl.	Excl.	Excl.	Excl.
Total Construction For HomeLab (Excl. VAT)					**€3,964,000**	**£3,409,040**

"Homelab" - Cost Summary

Item	GIFA / m2		Cost Range € / m2	Cost / Sq.m. € / m2	Total Dublin (Excl. VAT) € EUR	Total Belfast (Excl. VAT) £ GBP
Land Acquisition Costs:						
- Land Acquisition Costs	Excl.	Excl.	Excl.	Excl.	Excl.	Excl.
Stamp Duty	Excl.	Excl.	Excl.	Excl.	Excl.	Excl.
Legal Fees/Other Professional Fees	Excl.	Excl.	Excl.	Excl.	Excl.	Excl.
Other Non Construction Related Development Costs:						
- Development Fees & charges- 5% to 15% - allow 10% of construction costs	10	%			397,000	341,420
Design Team Fees - assumed 12.5% of construction costs (to include for Architect,						
- Planning Consultant, QS, C&S Engineers, Archaeologist, Environmental Consultants,	12.5	%			496,000	426,560
Ecologist, PSDP, etc.)						
- Investigation Works	Excl.	Excl.	Excl.	Excl.	Excl.	Excl.
- 1% for Public Art (assumed)	1	%			40,000	34,400
- Development Contingency	10	%			490,000	421,400
- VAT @ applicable rate	Excl.	Excl.	Excl.	Excl.	Excl.	Excl.
Note:						
Works to public utilities including service diversions are excluded from above costs						
Import Duties and Taxes are excluded from the above costs						
Lifecycle costs are excluded from the above costs						
Total Overall Development Cost for HomeLab (Excl. VAT)					**€5,387,000**	**£4,632,820**

"Plate" - Cost Summary

Item	GIFA / m2		Cost Range € / m2	Cost / Sq.m. € / m2	Total Dublin (Excl. VAT) € EUR	Total Belfast (Excl. VAT) £ GBP
1. Enabling Works (Site Infrastructure/Preparatory Works)						
Demolition of existing buildings	Excl.	Excl.	Excl.	Excl.	Excl.	Excl.
Site strip, preparation, preparatory earthworks etc.	Excl.	Excl.	Excl.	Excl.	Excl.	Excl.
Works to Neighbouring properties	Excl.	Excl.	Excl.	Excl.	Excl.	Excl.
2. "Plate" (R&D Labs and Production Kitchens for startup Companies)						
Refurbishment of existing space to create lab (incl furniture)	1,750	m2	€2,500 - €3,500	3,000	5,250,000	4,515,000
E/O Industrial Type Kitchens	270	m2	€750- €1250	1,000	270,000	232,200
External Bike storage, parking and basic landscaping	100	m2	€250 - €750	500	50,000	43,000
Service Yard for access	200	m2	€500 - €1,000	750	150,000	129,000
3. "Plate" (Anaerobic Digestor Plant) - Standalone Building						
New 50m2 Plant (provisional allowance - details required to ascertain accurate costs)	1	item			750,000	645,000
Works Outside Site Boundary:						
- Siteworks outside Site Boundary	Excl.	Excl.	Excl.	Excl.	Excl.	Excl.
Preliminaries & Insurances:						
- Preliminaries & Insurances	1	item			Incl.	Incl.
- Bond	1	item			Incl.	Incl.
Abnormal Cost:						
- Abnormal Cost Allowance (assumed 10%)	10	%			647,000	556,420
Design Development:						
- Design Development / Contingency (assumed 10%)	10	%			712,000	612,320
Inflation:						
- Allowance for future inflation	Excl.	Excl.	Excl.	Excl.	Excl.	Excl.
Total Construction For Plate (Excl. VAT)					**€7,829,000**	**£6,732,940**

"Plate" - Cost Summary

Item	GIFA / m2		Cost Range € / m2	Cost / Sq.m. € / m2	Total Dublin (Excl. VAT) € EUR	Total Belfast (Excl. VAT) £ GBP
Land Acquisition Costs:						
- Land Acquisition Costs	Excl.	Excl.	Excl.	Excl.	Excl.	Excl.
Stamp Duty	Excl.	Excl.	Excl.	Excl.	Excl.	Excl.
Legal Fees/Other Professional Fees	Excl.	Excl.	Excl.	Excl.	Excl.	Excl.
Other Non Construction Related Development Costs:						
- Development Fees & charges- 5% to 15% - allow 10% of construction costs	10	%			783,000	673,380
- Design Team Fees - assumed 12.5% of construction costs (to include for Architect, Planning Consultant, QS, C&S Engineers, Archaeologist, Environmental Consultants, Ecologist, PSDP, etc.)	12.5	%			979,000	841,940
- Investigation Works	Excl.	Excl.	Excl.	Excl.	Excl.	Excl.
- 1% for Public Art (assumed)	1	%			79,000	67,940
- Development Contingency	10	%			967,000	831,620
- VAT @ applicable rate	Excl.	Excl.	Excl.	Excl.	Excl.	Excl.
Note:						
Works to public utilities including service diversions are excluded from above costs						
Import Duties and Taxes are excluded from the above costs						
Lifecycle costs are excluded from the above costs						
Total Overall Development Cost for Plate (Excl. VAT)					**€10,637,000**	**£9,147,820**

"RegenPort" - Cost Summary

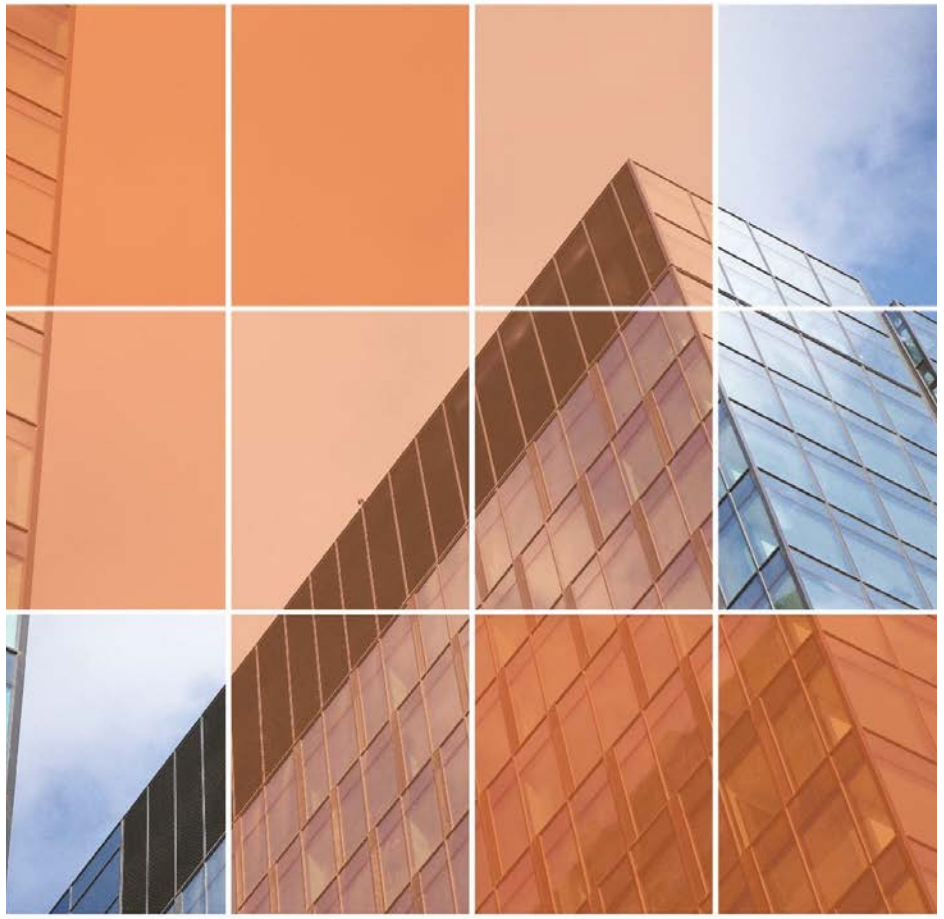
Item	GIFA / m2		Cost Range € / m2	Cost / Sq.m. € / m2	Total Dublin (Excl. VAT) € EUR	Total Belfast (Excl. VAT) £ GBP
1. Enabling Works (Site Infrastructure/Preparatory Works)						
Demolition of existing buildings	Excl.	Excl.	Excl.	Excl.	Excl.	Excl.
Site strip, preparation, preparatory earthworks etc.	Excl.	Excl.	Excl.	Excl.	Excl.	Excl.
Works to Neighbouring properties	Excl.	Excl.	Excl.	Excl.	Excl.	Excl.
Decontamination Works	Excl.	Excl.	Excl.	Excl.	Excl.	Excl.
2. "RegenPort" (Office/Managed Workspace - Port Location)						
Refurbishment of existing office space (incl furniture)	1,300	m2	€1,500 - €2,500	2,000	2,600,000	2,236,000
External Bike storage, parking and basic landscaping	300	m2	€250 - €750	500	150,000	129,000
3. "RegenPort" (Warehousing / Material Banks - Port Location)						
New Build Warehousing / Storage	500	m2	€1,500 - €2,000	1,750	875,000	752,500
E/o for additional warehouse / Material bank (Option)	500	m2	€1,500 - €2,000	1,750	875,000	752,500
Service Yard for access to warehouse / Material banks	500	m2	€500 - €1,000	750	375,000	322,500
Works Outside Site Boundary:						
- Siteworks outside Site Boundary	Excl.	Excl.	Excl.	Excl.	Excl.	Excl.
Preliminaries & Insurances:						
- Preliminaries & Insurances	1	item			Incl.	Incl.
- Bond	1	item			Incl.	Incl.
Abnormal Cost:						
- Abnormal Cost Allowance (assumed 10%)	10	%			488,000	419,680
Design Development:						
- Design Development / Contingency (assumed 10%)	10	%			537,000	461,820
Inflation:						
- Allowance for future inflation	Excl.	Excl.	Excl.	Excl.	Excl.	Excl.
Total Construction For RegenPort (Excl. VAT)					**€5,900,000**	**£5,074,000**

"RegenPort" - Cost Summary

Item	GIFA / m2		Cost Range € / m2	Cost / Sq.m. € / m2	Total Dublin (Excl. VAT) € EUR	Total Belfast (Excl. VAT) £ GBP
Land Acquisition Costs:						
- Land Acquisition Costs	Excl.	Excl.	Excl.	Excl.	Excl.	Excl.
Stamp Duty	Excl.	Excl.	Excl.	Excl.	Excl.	Excl.
Legal Fees/Other Professional Fees	Excl.	Excl.	Excl.	Excl.	Excl.	Excl.
Other Non Construction Related Development Costs:						
- Development Fees & charges- 5% to 15% - allow 10% of construction costs	10	%			590,000	507,400
- Design Team Fees - assumed 12.5% of construction costs (to include for Architect, Planning Consultant, QS, C&S Engineers, Archaeologist, Environmental Consultants, Ecologist, PSDP, etc.)	12.5	%			738,000	634,680
- Investigation Works	Excl.	Excl.	Excl.	Excl.	Excl.	Excl.
- 1% for Public Art (assumed)	1	%			59,000	50,740
- Development Contingency	10	%			729,000	626,940
- VAT @ applicable rate	Excl.	Excl.	Excl.	Excl.	Excl.	Excl.
Note:						
Works to public utilities including service diversions are excluded from above costs						
Import Duties and Taxes are excluded from the above costs						
Lifecycle costs are excluded from the above costs						
Total Overall Development Cost for RegenPort (Excl. VAT)					**€8,016,000**	**£6,893,760**

9.0 List of Exclusions

1	Site Acquisition and Financing Costs
2	Capital Contributions and Connection Fees - ESB, Gas, Telecoms, Drainage etc
3	Planning, DAC and Fire Safety Certificate Charges
4	Local Authority Charges and Planning Levies
5	Legal Costs / Agreements with Neighbours
6	LEED Certification / Wired Score
7	Performance Bond
8	Sculptures (note an allowance has been included from general art)
9	Owner controlled insurance policy
10	Road closure licences
11	Coffee machines (assumed lease)
12	Asbestos & other contaminated related works
13	Lifts
14	Lifecycle Costs
15	Enabling / Demoltion Works
16	Investigation Works
17	Additional Consultancy and Advisory
18	Future Material Price Inflation
19	Import dutes and taxes
20	VAT at applicable rate in each jurisdiction



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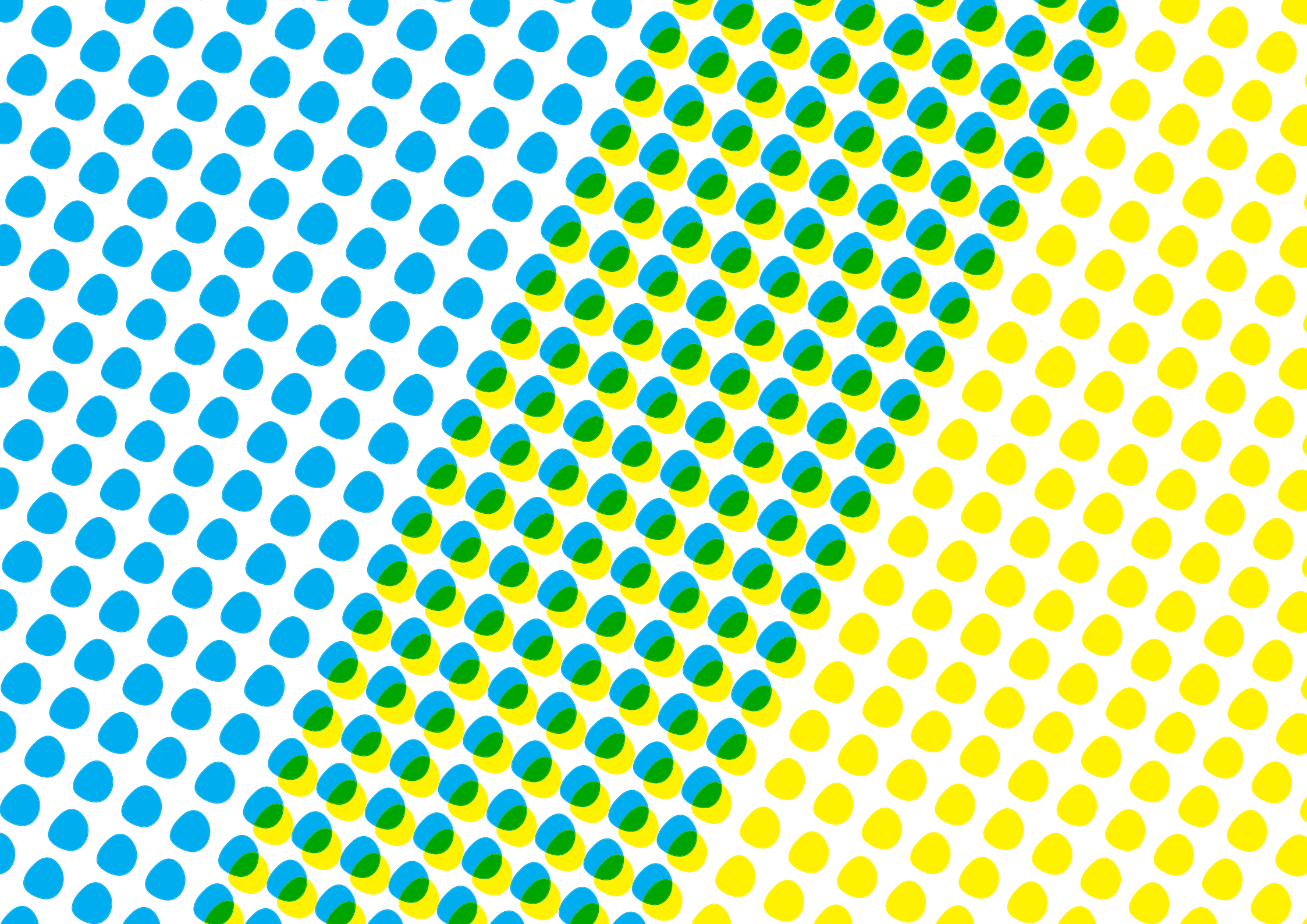

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