



A Circular Economy / Zero Waste Strategy for Derry City and Strabane District Council

Final Strategy


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Glossary / Abbreviations

	Definition
Co-mingled	The collection of mixed recyclate materials as a single stream into a collection truck
DCSDC	Derry City & Strabane District Council
HWRC	Household Waste and Recycling Centre
Kerbside sort	The sorting of recyclate materials at kerbside into different compartments of a specialist collection vehicle
KPIs	Key Performance Indicators
MBT	Mechanical Biological Treatment
MRF	Materials Recovery Facility
Off-specifications	Fresh produce that does not meet specification standards set by buyers (e.g. for size, weight, shape etc.)
Re-shoring	The act of reintroducing domestic manufacturing to a country
Secondary Materials	Manufactured material used at least once previously that will be used again after recycling
WEEE	Waste Electrical and Electronic Equipment

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1.0 Introduction

There is growing appreciation of the fact that by engaging with the principles of a Circular Economy, businesses can flourish, and jobs can be created, at the same time as the economy is placed on a more sustainable and resilient footing by bringing economic activity within the earth's carrying capacity, notably the constraints of climate change¹. A recent report indicates that through embracing the circular economy, more than 13,000 jobs at various skill levels could be created across Northern Ireland, and within a number of sectors, including food and drink, biorefining and the bioeconomy.² The Draft Industrial Strategy for Northern Ireland indicates that the Department for the Economy will work with the Department of Agriculture, Environment and Rural Affairs (DAERA) to develop a Circular Economy Strategy for Northern Ireland, recognising that *'If we are to make progress towards the goal of sustainable economic growth then we must embrace the concept of a circular economy, one that businesses have already started exploring today.'*

At the same time, a growing number of municipalities in Europe are aligning themselves with the principles of Zero Waste, in which those waste materials which do arise are, as far as possible, prepared for re-use and recycled, with residual waste being kept to a minimum. The definition of Zero Waste adopted by Zero Waste Europe and recognised within this project is as follows:

"Zero Waste is a goal that is both pragmatic and visionary, to guide people to emulate sustainable natural cycles, where all discarded materials are resources for others to use. Zero Waste means designing and managing products and processes to reduce the volume and toxicity of waste and materials, conserve and recover all resources, and not burn or bury them. Implementing Zero Waste will eliminate all discharges to land, water, or air that may be a threat to planetary, human, animal or plant health."

These municipalities are seeking to minimise the amount of waste that is generated which cannot be re-used, prepared for re-use, or recycled. The employment gains from shifting waste progressively from the more capital intense activities at the base of the waste hierarchy to the more employment intensive ones at the top also have the effect of creating jobs.

¹ The earth's carrying capacity has now been defined empirically as a series of nine planetary boundaries, including climate change <http://www.stockholmresilience.org/research/planetary-boundaries/planetary-boundaries/about-the-research/the-nine-planetary-boundaries.html>

² ReNEW (2015) *Job Creation in the Circular Economy - Increasing Resource Efficiency in Northern Ireland*, accessed 11 April 2017, <http://www.wrap.org.uk/sites/files/wrap/ReNEW%20CE%20Employment%20Report.pdf>

The two concepts – of Zero Waste and the Circular Economy – find a common base in the waste hierarchy: both seek to minimise the extent of what the Zero Waste community terms residual waste (and reducing this as far as possible is the key benchmark measure of performance for Zero Waste municipalities), and which the proponents of the Circular Economy term ‘leakage’. In the transition to a Circular Economy, the role of design – of products and of ways of doing business – is given particular emphasis, and there is a prominent role accorded to the business community. In the more active pursuit of Zero Waste – where municipalities and households play the lead role - this also leads to engagement with businesses, however, typically on matters related to the design of products and packaging that are obstinately leaking into the residual waste stream.

Derry City and Strabane District Council (DCSDC) finds itself under increasing financial pressures, and so reducing waste generation, gaining value from discarded products through preparing them for re-use, and seeking to recycle as much as possible in a cost-effective manner, can contribute to reducing the costs of waste management. At the same time, DCSDC has an interest in seeing businesses prosper and generate employment for the community, through both indirect and induced effects.

Municipalities around the world are already seeing the rewards and demonstrate considerable progress towards the Zero Waste goal, providing sufficient resource is committed to implementation. In Capannori Italy, starting from similar levels of residual waste to Derry and Strabane, a 57% reduction was achieved in just 5 years. This, and a growing number of other examples, demonstrate the opportunity for individual municipalities to take action, and set their own Zero Waste aspirations. Coupling this activity to measures to foster the development of a Circular Economy holds particular promise for the development of business and employment in the DCSDC area, and in the broader North West Region.

2.0 Vision

Derry City and Strabane District Council (DCSDC) is pursuing a clear vision for a Zero Waste Circular Economy. This is defined in the community plan as an economy where:³

“resources are used for as long as possible, have maximum value extracted from them and are recovered and regenerated at the end of their service life to achieve a Zero Waste Circular Economy”.

This involves, in order of priority, seeking to prevent waste from arising in the first place, encouraging its preparation for re-use, and prioritising separate collection of waste for recycling and composting / digestion. Any residual waste that cannot be dealt with through these means should be treated before disposal so that the environmental

³ Our Community Plan https://issuu.com/derrycitycouncil/docs/commplanupdate_booklet

impact of final disposal is minimised. This approach understands that design of products hugely influences the potential to prevent waste by extending product life (which also facilitates reuse and preparation for reuse), and by facilitating easy disassembly and thus recycling of its constituent resources (Figure 1).

The strategy should deliver Environmental, Economic and Social benefits aligning with DCSDC's Three Community Planning Thematic Pillars. With economic growth a high priority for Derry and Strabane, designing a system which is able to extract greater value from improved management of materials and products, and which can also decouple economic growth from the generation of waste, is considered highly desirable so as to deliver environmental, social and economic aspirations in tandem.

At present, there is only a single Zero Waste Europe Municipality within the UK (Bute), although Bute is one of two Zero Waste towns supported by Zero Waste Scotland (the other being Dunbar). Within the Irish Republic there is one municipality working towards Zero Waste, Cashel⁴, although it is not yet recognised by Zero Waste Europe as a Zero Waste Municipality⁵. As such Derry and Strabane has the opportunity to take a leading role within the UK and the island of Ireland by transforming the area into a Zero Waste Circular Economy. In order to do this however, it will need to transform its approach to dealing with 'waste' - a culture shift in both attitude and behaviour - within the region. International experience shows that this would involve the council actively considering the adoption of a phased strategic change to collection methods in tandem with public education which redefines 'waste' as vital resources. *"It's not waste until it's wasted"*

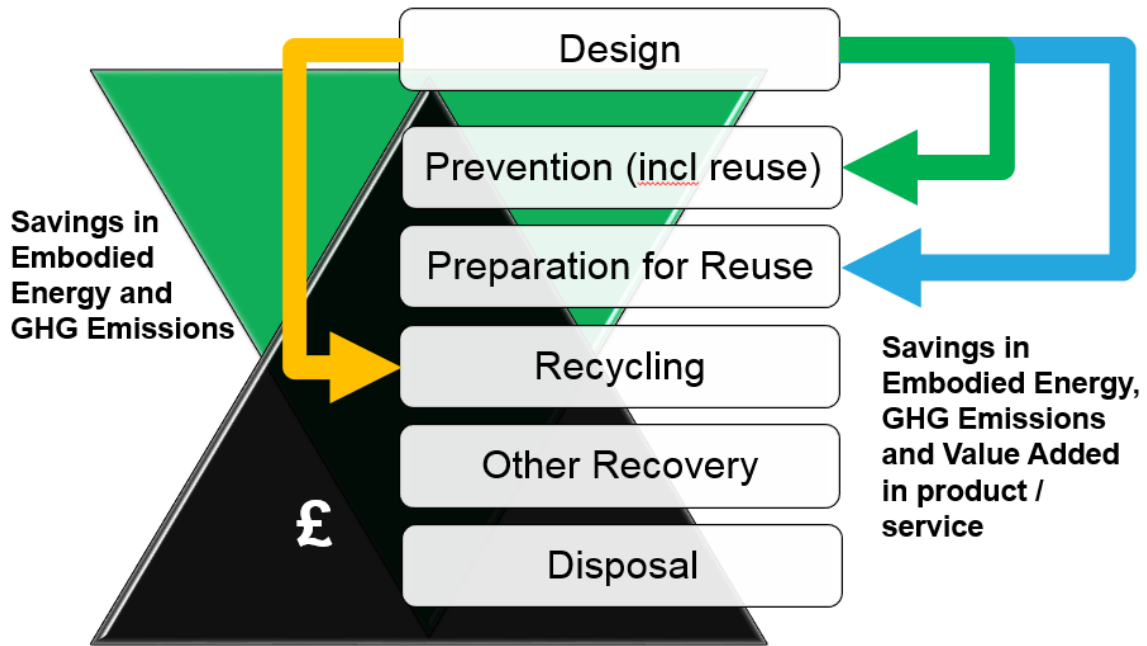
These actions will demonstrate a progressive Council responding to impending issues of waste and climate change as well as having the potential to create jobs and save the Council money. Good progress is already being made by the Council in this direction with the roll out of food waste collections and upgrading of HWRCs.

This document sets out the current position in Derry and Strabane, suggests policies for a strategy to take the area towards the vision of a Zero Waste Circular Economy and offers examples of how key sectors within the area could become more circular and the benefits this could yield.

⁴ <http://www.zerowastecashel.ie/>

⁵ <http://zerowasteurope.eu/zerowastecities.eu/>

Figure 1: Influence of Design on the Waste Hierarchy



3.0 Where Are We Now?

3.1 Waste and Recycling Service

In 2015/16 DCSDC collected 67,526 tonnes of household waste, of which 33% was recycled. Although a significant improvement on the past, DCSDC is the authority with the lowest recycling rate in Northern Ireland. Relative to other authorities in Northern Ireland, the reported performance on dry recycling is relatively good, with overall performance being pulled down by the weakness in respect of collection of biowastes (see below). Provisional 2016/17 figures show further improvement, but were not available at the time of research.

The current and planned service is as follows:

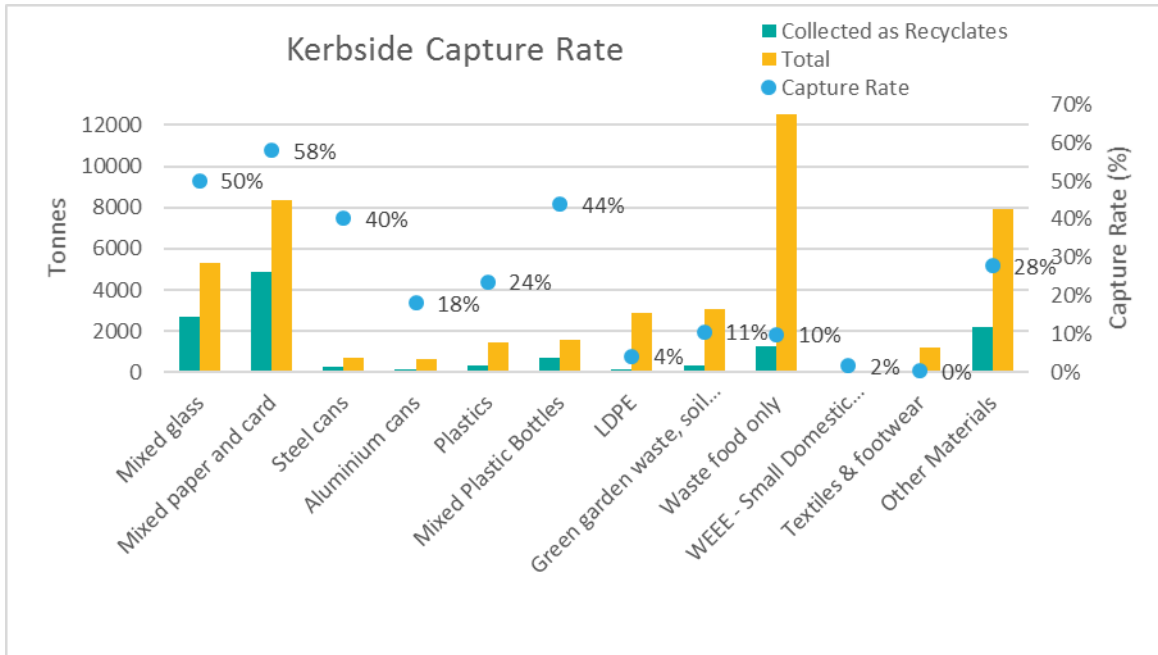
- Kerbside:
 - fortnightly co-mingled recycling from 240 litre wheeled bins;
 - fortnightly residual collections from 240 litre wheeled bins;
 - weekly food waste collection from 23 litre caddies to 30,000 households (full roll out by Autumn 2017 to 50,000+ households⁶); and

⁶ At present there are 58,000 households in the DCSDC area, projections of household growth were taken from NISRA

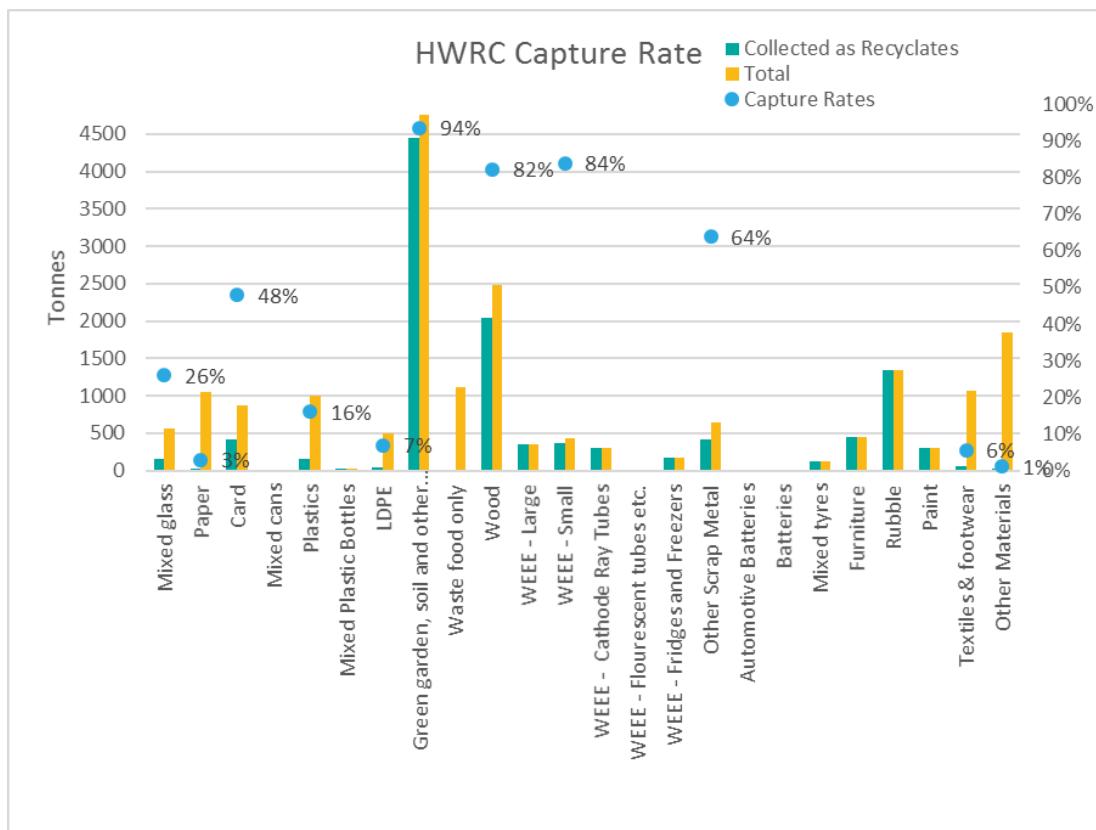
- fortnightly free garden waste collections from wheeled bins for ≈15% households.11 Household Waste and Recycling Centres (HWRCs) and 13 Bring Sites: HWRCs achieved a recycling rate of 66% in 2015/16.

Figure 2 shows how the system was performing in 2015/16, indicating the capture of specific materials by the recycling service. The Figure demonstrates the opportunities to increase capture of readily recyclable materials.

Figure 2A + B: Kerbside and HWRC Capture Rate 15/16⁷



⁷ NWRWMG composition data and Northern Ireland 2015/16 data note capture rates of 0% or 100% not shown



Key observations regarding the above are:

- that in 2015/16, the material accounting for the largest share of residual waste was food waste;
- the capture of some key materials, which are present in large quantities in the waste stream, shows room for considerable improvement. This includes recyclables already being targeted by the service, such as glass, paper and card, and plastics;
- there is a considerable proportion of garden waste and metal in the kerbside waste stream still being collected in the residual waste bin; and
- the HWRC composition and capture data suggests that there is a considerable amount of ‘kerbside-style residual waste’ arriving at HWRCs.

It is clear that more can be done to reduce leakage of material into the residual waste stream, and some of the planned measures are likely to contribute to further progress in this regard.

Although most of the wastes generated by commerce and industry are not collected by the local authority, when considered as a potential source of valuable materials and products, it makes sense to consider what the opportunity may be in the DCSDC area. Data on commercial and industrial (C&I) wastes are not of good quality. Based on scaling of estimates from 2009/10, it is estimated that C&I waste in the area amounts to 81,000 tonnes annually, while estimates of construction, demolition and excavation (CD&E) waste suggest a further 79,000 tonnes are generated (see Table 1) in the area. There is a history of illegal waste sites in Northern Ireland, with the Mobuoy site in the Derry area

being a particular case in point, and while action has been taken to reduce the extent of this problem⁸, it is possible that the non-local authority waste figures may be somewhat underestimated as result of this activity. In any case, there is a lower level of confidence attached to the fate of wastes outside the local authority’s control.

These combined figures indicate that of the total of 227 thousand tonnes of waste generated, an estimated 104 thousand tonnes are still to be found in residual waste. The treatment and disposal of this material incurs an estimated annual bill of £10.2m⁹, borne by residents and businesses in the area, and this excludes the cost of collection.

Table 1: Reported Waste Arisings in Derry and Strabane

Category	Reported Arisings (tonnes)	Proportion Recycled, Prepared for Re-use, Composted or Recovered (as material)	Resource Loss (sent for disposal or energy recovery) (tonnes)
Local Authority Collected Household Waste ¹⁰	67,526	33%	45,026
Commercial and Industrial ¹¹	80,903	56%	35,597
Construction, Demolition and Excavation ¹²	78,690	71%	22,820
Total / Weighted average	227,119	55%	104,192

3.2 Reprocessors

There are a number of reprocessors of secondary materials based in Northern Ireland (notably Huhtamaki, Cherry Plastics and Encirc). Nonetheless, at present, more than 90% of dry recyclable materials handled by DCSDC are exported, some being sent elsewhere within the UK and some travelling much further afield. This implies a loss of potential value added, and employment opportunities, from the local economy.

⁸ <https://www.daera-ni.gov.uk/news/niea-join-forces-other-law-enforcement-agencies-target-illegal-waste-operators> and <https://www.daera-ni.gov.uk/publications/review-waste-disposal-mobuoy-site-and-lessons-learnt-future-regulation-waste-industry>

⁹ Based upon cost of residual treatment of £110 per tonne provided by Derry City and Strabane District Council - this applies to all LAC waste, C&I waste and 50% of CDE waste assuming 50% is exempt based on Green Construction Board

¹⁰ (2016) *Northern Ireland local authority collected municipal waste management statistics 2015/16 annual report* | Department of Agriculture, Environment and Rural Affairs, accessed 11 April 2017, <https://www.daera-ni.gov.uk/publications/northern-ireland-local-authority-collected-municipal-waste-management-statistics-2015> Household Waste only

¹¹ WRAP (2011) *Northern Ireland Commercial and Industrial (CandI) Waste Estimates 2009*, November 2011

¹² RPS (2011) *Construction, demolition and excavation waste arisings, use and disposal in Northern Ireland 2009/10*, Report for WRAP, June 2011

The sorting facility used to separate mixed dry recyclables into clean material streams is currently based outside the authority area, which also implies a loss of potential employment to the area (employment in the authority area would increase if the collection service were changed, or if sorting took place more locally, ideally at source). Increasing recycling rates (the potential for which is indicated in Figure 2) can further increase secondary materials available for local reprocessing, though the likelihood of materials being reprocessed locally will be greatest where the quality of material collected is high. There is a strong relationship between the quality of the recyclates recovered and the prospect of maximising the extraction of social value including job creation. (see 6.3).

3.3 Economy and Demographics

Derry and Strabane is one of the most deprived areas of Northern Ireland with 43% of the population living in an area defined as ‘deprived’. Employment rates stood at 60% in 2015, and the claimant count was the highest in the UK in 2016 at 6.4%. Geographically, Derry and Strabane borders the Republic of Ireland (RoI) and experiences cross-border movement. The economic catchment effectively extends into Donegal, and cross-border movement of people, materials and products are influenced by exchange rate movements. As a participant in the North West region, Donegal has expressed interest in this work, and engaging with DCSDC in carrying forward circular economy initiatives.

Employment is dominated by the service sector (Table 2) whilst Agriculture, Forestry and Fishing businesses, likely comprising, mostly, farm-based enterprises are the most common businesses. Manufacturing, which may be of particular importance in terms of Circular Economy prospects, makes up 9% of employment, and notable manufacturing businesses in Derry and Strabane include SeaGate and DuPont.

Table 2: Number of employee jobs by industry sector and number of VAT and/or PAYE registered businesses by broad industry group for largest industries in DCSDC area¹³

	Number of Businesses 2016	%	Number of Jobs 2015	%
Agriculture, Forestry and Fishing	1,205	25%	50*	0%
Construction	710	15%	2,240	4%
Wholesale & Retail	660	14%	9,280	17%
Arts, Entertainment, Recreation and Other Services	325	7%	1,260	2%
Professional, Scientific and Technical	310	6%	1,240	2%

¹³ <http://www.derrystrabane.com/Subsites/Derry-and-Strabane-Statistics/Economy-and-Labour-Market>

	Number of Businesses 2016	%	Number of Jobs 2015	%
Manufacture / Production	290	6%	5,090	9%
Accommodation and Food Services	285	6%	3,410	6%
Health / Human Health and Social Work	240	5%	11,600	22%
Administrative and Support Service	145	3%	3,260	6%
Information and Communication	95	2%	1,870	3%
Education	45	1%	6,040	11%
Public Administration and Defence			3,790	7%

* figures exclude agriculture but include animal husbandry service activities and hunting, trapping and game propagation. DAERA, Agricultural Census indicates total agricultural labour force for DCSDC of 3,341 for 2015

4.0 Strategy Development

4.1 Review of Best Practice in Other Municipalities

Broadly speaking, proven Zero Waste practices used in other municipalities are:

- Prevention
 - Educational campaigns regarding waste prevention (for example, in respect of single-use disposable items: these can be linked to initiatives such as a network of water fountains, or of cafes / restaurants and bars where water bottles can be refilled for free);
 - Communicating waste prevention possibilities to consumers (for example, in respect of food waste);
 - Support for re-use / repair cafes;
 - Supporting the use of re-usable items (crockery, cutlery) at public events, and use of deposit refund schemes on reusable cups (to reduce litter);
 - Subsidies for householder initiatives such as home composting and reusable nappies;
 - Greening procurement to eliminate procurement of disposables where re-usable options exist, increase the recycled content of what is purchased, and opt for more durable items / service models of provision;
 - Working with businesses to re-design packaging / products that routinely end up in residual waste; and
 - Pay As You Throw (PAYT) schemes;

- Preparation for Re-Use
 - Support for the preparation for re-use of textiles, WEEE and furniture through:
 - Designating areas for re-use at HWRCs;
 - Allowing ‘first call’ for re-use operations on bulky wastes;
 - Signposting residents to re-use organisations;
- Recycling / Composting
 - Communication / awareness campaigns regarding use of the service, and the results and benefits being achieved;
 - Restriction on volume for residual waste collection;
 - Increasing the convenience of recycling relative to residual waste collections;
 - Prioritising separate collection to reduce contamination;
 - Well-staffed and organised HWRCs;
 - Use of incentives, such as PAYT; and
 - Using sorting of mixed wastes to capture recyclables not captured through the kerbside collection / HWRC recycling systems (typically, focusing on plastics, paper and card, metals, and inert materials) so as to minimise residual waste. (This tends to work better where residual waste is relatively dry, and so is supported by the separate collection of food waste).

4.2 Modelling

Modelling of four different future waste management scenarios was carried out, details of scenarios and results are shown in A.1.0. This modelling was used to demonstrate how changes to conventional waste management can deliver “significant wins” in the move to a Zero Waste Circular Economy under each of DCSDC’s thematic pillars of Social, Economic and Environmental enhancement. Based on the modelling conducted the actions which lead to the biggest social, economic and environmental benefits are demonstrated below.

Zero Waste Circular Economy	<ul style="list-style-type: none"> • Recycling collection system where materials collected are valued and can be reprocessed within local economy. • Reduction in residual waste through moving recyclate and organic waste out of residual waste stream and waste prevention initiatives. • Sorting of residual waste to extract additional recyclables.
Environmental - Recycling Tonnage and Reduced Residual	<ul style="list-style-type: none"> • Reduction of waste through waste prevention. • Increased capture of dry recyclables reducing GHG emissions. • Improving food waste captures through education and delivering low carbon energy.
Social - Employment	<ul style="list-style-type: none"> • Use of a kerbside sort system where sorting is undertaken by staff • Switching to a recycling collection system where material value is retained within the region and materials can be reprocessed generating further employment. • Further re-use initiatives at HWRCs incl. upskilling of staff. • Food redistribution.
Economic - Cost to Council	<ul style="list-style-type: none"> • Charging for garden waste at kerbside. • Lower costs for treatment / disposal. • Moving food and recyclate out of residual to dedicated collection / treatment. • Improved efficiency of use of existing services. • Generating revenue from sale of goods prepared for re-use or recycled.

5.0 Circular Economy Opportunities by Sector

Based upon the prominent sectors in terms of number of businesses and employment within the Derry and Strabane area (3.3), there are a number of sector specific opportunities for driving the economy in a more circular fashion.

5.1.1 Agri- Food

Agriculture is significant to DCSDC in terms of business numbers, and the food service sector is among the largest employers (Table 2). Food and drink is the sector that typically contributes the greatest share to commercial waste arisings and food waste is widely recognised as a significant problem, and one which, if addressed proactively, can generate economic benefits (from preventing waste). The key point is that the prevention of waste typically delivers benefits not only in respect of waste management

costs, but more importantly, in avoiding raw materials costs (which are typically around a factor of 20 higher for the sector).¹⁴ The waste hierarchy should be followed whereby:

- **Prevention of avoidable food waste is prioritised.** There is potential to achieve this within the sector, but also by extension through households, using innovations such as extending storage and shelf life. Avoidable household food waste collected at kerbside has the potential to deliver ~£7.8 million Gross Value Added (GVA) benefit in Derry and Strabane, while avoidable food waste within industry in Derry and Strabane has potential to achieve ~£0.7m GVA benefit value. There are also opportunities on farms to reduce food losses via appropriate storage, pest / disease management, and cross supply chain engagement to reduce wastage through issues such as off-specifications and mismatches of supply and demand.
- **Re-use / re-distribution of food surplus.** FareShare Northern Ireland, a charity which operates across Northern Ireland, including in Derry and Strabane, redistributes surplus food and calculates a social and economic return on investment of £8 for every £1 invested in its work.¹⁵
- **Any food waste which cannot be prevented or re-used / re-distributed can be separated for use in anaerobic digestion or composting plants,** both of which generate beneficial products which can be used in the growing of food, thus recirculating into agriculture. Anaerobic digestion has the added benefit of generating energy.

Other opportunities for Circular Economy in the agri-food sector include:

- **Leasing models of capital equipment:** there is the opportunity to adopt leasing models for capital equipment both for kitchens / food preparation and also in agriculture, which could enable use of latest smart precision technology and more efficient resource use.
- **Sustainable agriculture:** For agriculture there are opportunities to reduce external inputs, particularly those which are imported, such as 90% of Northern Ireland's animal feed, moving towards a closed loop system and focusing on sustainable intensification principles whereby outputs are increased whilst the environment and ecosystem services are protected. The Rural Development Programme (Regional) - Northern Ireland already supports some of these goals.

¹⁴ Research undertaken by WRAP suggests that total preventable household food waste ranges between 4.2 and 5.4 million tonnes per annum and is worth a total of £12.5 billion (WRAP (2016) *Estimates of Food Surplus and Waste Arisings in the UK*, May 2016, www.wrap.org.uk/sites/files/wrap/UK%20Estimates%20May%202016%20%28FINAL%20V2%29.pdf) This is equal to £2,604 per tonne of preventable food waste if one takes the average of the range suggested by WRAP (i.e. 4.8 million tonnes). This compares with disposal costs of the order £100 per tonne.

¹⁵ Council for the Homeless NI (2014) *CHNI FARESHARE food sharing network SROI*, accessed 10 April 2017, [http://www.chni.org.uk/CHNI%20FS%20SROI_v2\(2\).pdf](http://www.chni.org.uk/CHNI%20FS%20SROI_v2(2).pdf)

- **Shortening agricultural supply chains:** As an agricultural area, there is also an opportunity to shorten supply chains and reduce consumer packaging and transport by encouraging residents to buy local and farmers to sell local.

5.1.2 Human Health and Social Work Activities

Within the healthcare sector there is considerable scope for improvement of waste management, particularly:

- **Reducing avoidable food waste in hospitals:** currently the biggest source of non-hazardous waste in healthcare. This could be facilitated through re-design of food delivery and disposal services and good communication to avoid unnecessary food preparation.
- **Refurbishment and preparation for re-use:** this spans all scales from consumables to equipment. For example, re-usable nappies in hospitals can deliver significant waste reduction and cost savings as can the refurbishment of large capital equipment. The continuation of the Council's scheme of collecting unused hospital equipment for re-use is a further example.
- **Recycling:** plastic is a large component of hospital waste, a large proportion of this is non-hazardous with recycling potential.

Another Circular Economy concept which can be applied to the healthcare sector is the use of procurement models where consumers pay for use of equipment rather than purchasing product upfront. This leads to savings on up-front costs, maintenance and end-of-use treatment. This type of procurement is already being implemented in many hospitals, especially in Germany.

5.1.3 Wholesale and Retail

The wholesale and retail sector can facilitate the transition to a Circular Economy in several ways:

- **Packaging:** retailers are in a position to redesign packaging to reduce volume with the benefit of also reducing costs and extending to litter and street scene benefits. Although it would be difficult for DCSDC to implement by itself, Northern Ireland could also introduce a Deposit Refund Scheme for packaging, building on the success of the carrier bag charge in Northern Ireland. There are ongoing discussions in the Republic of Ireland around such a scheme, so the potential for an all island scheme does currently exist;
- **New business models:** for example, take-back schemes to repair and refurbish products at end of life.
- **Design:** using upstream influence to move towards products which are more circular, for example with longer life expectancies.
- **Suppliers:** similar to public sector green procurement, the private sector can contract only with suppliers that meet certain criteria around waste reduction and Circular Economy.

- **Consumption patterns:** consideration of price points and promotions to influence buying behaviours which are more sustainable (e.g. less BOGOF offers which can generate waste).

The Fashion and Textile Design Centre, established with support from DCSDC, is a route through which the Council could influence the design of retail products. For example, the centre could be tasked with looking at innovative ways to reduce waste and move fashion and textiles to a more Circular Economy – a movement with the potential to reignite Derry’s historical textiles industry.

5.1.4 Education

As outlined in the policies below (6.1), education plays a key role in a transition to a Zero Waste Circular Economy and educational institutes can be utilised to disseminate information about the strategy. The education sector also plays a vital supporting role in providing a workforce skilled in areas required for a Circular Economy, such as refurbishment, remanufacture and product design. The North West Regional College offers a number of courses with the potential to embed Circular Economy skills, such as construction and design courses, as does the University of Ulster Magee Campus, where courses include Creative Technologies and Engineering. The Pennyburn Re-Use centre’s current provision of up-skilling opportunities could be further expanded based upon the volume of material with potential for re-use (6.2) and the potential to implement preparation for re-use on higher value items, requiring more specialist skills and delivering greater financial returns.

5.1.5 Manufacturing

If DCSDC is able to generate high quality recyclate from its kerbside collection system and HWRCs, there will be an opportunity for businesses to start up to reprocess this secondary material. There are an estimated 28,600 tonnes of secondary material exported from Derry and Strabane at present (including household and commercial waste).¹⁶ As there are already reprocessors within Northern Ireland that will likely provide obvious markets for certain materials, focusing on materials which are not currently reprocessed in Northern Ireland may offer the greatest business opportunity for Derry and Strabane. There are a number of ‘problem waste streams’ which are emerging, and which will need to be dealt with in future years as they move from the use phase and into the waste stream. Examples include solar panels, products made using carbon fibre, novel battery technologies, LED light fittings, and other products. None of these streams lends itself to large numbers of reprocessing facilities since the quantity of material available will not be sufficient to justify the types of investment likely to be required. Consequently, port cities acquire some strategic significance since

¹⁶ Suez (2016) *A Resourceful Future – Expanding the UK Economy*, accessed 11 April 2017, <http://www.sita.co.uk/downloads/ResourcefulFutureReport-SUEZ-1609-web.pdf> scaled to DCSDC

they become sites of potential aggregation of waste materials and products which contain materials of value. Opportunities exist, therefore, to identify waste streams whose reprocessing links to other aspects of the economy, and where the DCSDC area can become a leading player across Europe.

For existing manufacturing operations within the area, there are opportunities to become more circular, including through designing products for longer life, and shifting towards patterns of consumption that are not based on outright ownership (using leasing models). Greater emphasis on design for re-use, recyclability, and assessing the scope for enhanced process efficiencies and elimination of waste in production, are also important activities with the potential to generate bottom-line benefits.

5.1.6 Construction

The Circular Economy offers many opportunities for construction. The design of new buildings and choice of materials should be based on Circular Economy concepts, such as durability, disassembly and flexibility, with an aim of keeping buildings and resources in use for as long as possible.¹⁷ As a procurer of construction services, DCSDC has the opportunity to influence Circular Economy practices within the construction sector, particularly via use of green procurement for Council funded buildings (6.4). DCSDC has further powers through the planning system to influence green design in construction, possibly through setting standards for the local planning system¹⁸ and the retention of a bond to ensure standards are met in final construction. There are number of practices relevant to both public and private sector:

- Selective demolition could lead to increased savings through take-back and re-use of materials such as timber and structural metal, waste separation and high-quality recycling of building components.¹⁹ This is a particularly attractive prospect for Northern Ireland as it could help boost the repair and maintenance sector, which is currently now growing as fast as new-build.²⁰
- Using industrialised production processes, modularisation and 3D printing in order to reduce cost and time of construction and renovation.²¹

¹⁷ Sustainable Procurement Ltd, and Eumonia Research and Consulting (2017) *Procuring Resource Efficient Construction Projects*, January 2017

¹⁸ On 1st April 2015 planning powers transferred from the Department of the Environment (DOE) to the Derry City and Strabane District Council.

¹⁹ Zero Waste Scotland (2017) *RAP002-001 - Identification of Circular Economy Opportunities in the Scottish Construction Sector*, April 2017

²⁰ CITB (2016) *Industry Insights - Construction Skills Network Forecast Northern Ireland 2016-2020*, 2016, <http://citbni.org.uk/CITB/files/be/be07123e-3ab2-4d50-80c7-e2128626c797.pdf>

²¹ Ellen MacArthur Foundation (2015) *Delivering the Circular Economy A toolkit for policymakers*, June 2015

- Leasing materials for use. This would open new business opportunities for providing leased, recycled materials to new construction work.²²
- Sharing, multi-purposing and repurposing of buildings.

There are opportunities to work with construction companies in the area to help them in terms of specifying, and including within contracts, practices which support a less wasteful approach to construction.

6.0 Zero Waste Circular Economy Strategy Policies

This section proposes policies for the Council to include within a Zero Waste Circular Economy Strategy, split into themes as below, along with the supporting rationale. A draft of these policies was discussed at a Roundtable discussion and has been reviewed by DCSDC and ZWNW.



²² Eunomia Research and Consulting (2015) *Scoping Study for a Route Map to a Circular Economy in London*, June 2015

6.1 Behavioural Change and Education

Policy 1: The Council will commit resources to a campaign to communicate and inform its residents of the benefits of a Zero Waste Circular Economy strategy. Within this, it will promote waste prevention, effective use of kerbside collection schemes, and opportunities for re-use through bulky waste / Household Waste & Recycling Centres. Communities will be made aware of the positive reasons for undertaking such activities.

Policy 2: The Council will embed education on the Zero Waste Circular Economy strategy into school education programmes.

Policy 3: The Council will support home composting and reusable nappies for residents.

Behavioural change and education underpins every aspect of the strategy, and without support from residents and businesses achievement of a Zero Waste Circular Economy is not possible. All the subsequent policies require education and behaviour change to become successful. To achieve waste prevention, in the absence of powers to introduce PAYT, the Council's main power is around education of residents and businesses: where appropriate, this should be aligned with national government messages.

In recognition of the importance of education, the Council should assign a specific budget for education. The need for adequate communications funding is echoed by Northern Ireland Assembly and WRAP research, which indicates a new service communication would cost up to £2 per household, with up to £1 per household required for ongoing communication of existing services²³. Indicative costs and a guide to increasing recycling through effective communications is available from Zero Waste Scotland²⁴. To be cost effective, wherever possible, existing channels such as local media outlets or existing school waste education programmes, should be used. Thornhill College has already demonstrated success in moving towards Zero Waste and empowering and educating pupils²⁵. Messages should be tailored to the audience to increase chance of success. For example, if savings from waste management are utilised for community investment the economic message has strong appeal, for other groups the environmental message may be more powerful.

For householders, two specific behavioural changes the Council can support, via the use of subsidies, are home composting and reusable nappies. Both waste prevention

²³ <http://data.niassembly.gov.uk/HansardXml/committee-20280.pdf>

²⁴

http://www.zerowastescotland.org.uk/sites/default/files/Improving%20Recycling%20Through%20Effective%20Communications_ZWS_0.pdf

²⁵ <http://www.thornhillcollege.org.uk/eco-schools/thornhills-journey-to-zero-waste>

initiatives operate successfully elsewhere and can divert waste from Council collected waste streams. Nappies and garden waste are both notable components of the Council's residual waste at present. The communication of these initiatives can be supported by best practice case studies, and the distribution and use of reusable nappies could be encouraged via the health service. There is the opportunity for social enterprises to be engaged in delivery of reusable nappy initiatives, and the initiative could be extended into other reusable sanitary products.²⁶ For home composting, the initiatives can be extended to schools with compost product used to grow fresh produce and linked back to health outcomes.

Policy 4: The Council will involve communities within the implementation and dissemination of the Zero Waste Circular Economy strategy through a coordinated programme of continuous engagement.

There are a number of existing networks that can be tapped into to facilitate behavioural shifts, for example, community groups, schools, business networks, NGOs, and so on. Use of these groups is a key way to generate further buy-in to the strategy. Working closely with the community and voluntary sector can help leverage additional resource to engage the local community with the strategy and use of prevention, preparation for re-use and recycling initiatives. Communities should be empowered to take ownership of the strategy, with champions (like Thornhill College) identified in individual communities / sectors. Joined up, cross-sectoral action at the top level of Council will help facilitate the education process, for example between economy, health and education.

Policy 5: The Council will use its interactions with local businesses to promote behavioural change towards Zero Waste Circular Economy (see 6.5 also)

The Council is interacting with local businesses on a regular basis, both directly and indirectly: these interactions can serve as a basis for promoting the benefits of embracing a Zero Waste Circular Economy. In addition, in respect of its economic development activity, consideration should be given to including a commitment to a Zero Waste Circular Economy in the branding of DCSDC's offering to inward investors.

This could also be linked to initiatives that the Council can take (see below) to encourage and incentivise Zero Waste Circular Economy business activity. Key messages for business are likely to relate to waste prevention, information about 'waste materials' (industrial symbiosis) and encouraging recycling so as to enhance CSR credentials and – in some cases – reduce waste management costs. Other messages, relating to changes in

²⁶ <http://www.recycleforgloucestershire.com/reduce-your-waste/real-reusable-nappies/stroud-real-nappy-project/>

business models, will be more or less relevant depending on the business and the sector which it is in (See 6.5 also).

Policy 6: The Council will promote food waste prevention for householders and businesses.

Food waste across the supply chain is a particular issue which is receiving increasing attention, particularly given the high proportion which is preventable. Based upon UK research, with the results scaled to Derry and Strabane, there could be an increase in GVA of £7.8m per annum to be gained from food waste prevention in households (compared to £8.6m in benefits that could be gained from waste prevention of other materials). These values are calculated based on the tonnage of food waste (Figure 2), the proportion of this which is avoidable^{27,28} and the GVA benefit per tonne²⁹. The messages from the TRiFOCAL London project³⁰, which aims to use innovative approaches to prevent household food waste, promote sustainable eating and ensure recycling of unavoidable food waste, could be used to inform engagement with householders.

Policy 7: The Council will commit to ongoing promotion of the Zero Waste Circular Economy Strategy, and the progress made, to reinforce the message.

In order for the strategy to build momentum and to be successful, there needs to be ongoing communication, both to ensure further progress is made towards set targets, and to sustain the momentum for behaviour change. Whilst there is likely to be a higher initial outlay of resources in Year 1 on promotion of the strategy, there also needs to be an ongoing commitment of resources. Often, the investment required for behaviour change can seem hard to justify when compared to large capital projects, but investment in communication is vital on an ongoing basis. Where data has been analysed for return on communication campaigns, investment returns are good, for example on food waste communications returns of between £8 and £250 for every £1 invested have been seen³¹. Although the immediate benefit, in these cases, arises in terms of savings to

²⁷ WRAP (2013) *Household Food and Drink Waste in the United Kingdom in 2012, 2013*

²⁸ *WRAP food surplus and waste research overview (FINAL).pdf*, accessed 11 April 2017, <http://www.wrap.org.uk/system/files/private/WRAP%20food%20surplus%20and%20waste%20research%20overview%20%28FINAL%29.pdf>

²⁹ This is calculated as £1,042 per tonne for household food, based on overall GVA gain²⁹. These calculated benefits include Direct, Indirect and Type 2 GVA²⁹ multipliers which account for consequent GVA change for the economy as a whole as a result of direct change, for example if consumers spend less on food, due to decreased wastage, they have more to spend on other areas with consequent impacts (e.g. increased spending on leisure activities leading to increased employment in that sector).

³⁰ http://www.wrap.org.uk/TRiFOCAL_PR

³¹

http://www.wrap.org.uk/sites/files/wrap/Report_The%20Business%20Case%20for%20Reducing%20Food

households and to businesses, the indirect consequences are that additional economic activity can take place in other sectors of the economy: the strategy is as much ‘invest to grow’, as it is ‘invest to save’.

6.2 Optimisation of Preparation for Re-use

Policy 8: The Council will review existing preparation for re-use and repair initiatives in Derry and Strabane to increase the amount of material re-use locally.

Policy 9: The Council will set targets for the preparation for re-use of furniture and WEEE collected by Council. These could be 30% furniture and 20% WEEE prepared for re-use by 2020.

Policy 10: The Council will utilise re-use credits and ensure HWRC and Bulky Waste services prioritise donation of usable items wherever possible.

The Council already operates the 4 R’s re-use centre at Pennyburn HWRC for furniture and electrical goods, but there are likely to be further opportunities for re-use since, in 2015/16, only 12% of furniture, and 2% of WEEE, presented at all HWRCs was prepared for re-use. This could include re-use centres at other HWRCs, expanded opening hours to synchronise with HWRC opening hours³² and an increased range of materials. There will also be further opportunities relating to commercial re-use not quantified here.

Re-use centres offer employment, the opportunity to learn new skills, and can be self-supporting financially, using profits from the sale of refurbished items, often to less well-off households. There is further potential for higher value, more specialist items to be refurbished for re-use, such as electronics, which develop more specialist skills and generate employment. There are a number of existing organisations which can support re-use within the area, for example Ulster Supportive Employment, Community Reuse Network Ireland and Men’s Sheds Association. Re-training, job-creation and the wider benefits this entails should be emphasised in any re-use and repair initiatives. These jobs tend to provide opportunities suited to high long term unemployment³³.

From a Council perspective, these initiatives could be supported by putting in place Council re-use targets for furniture and WEEE, and targeting materials not currently re-used, such as mattresses (for which, an opportunity exists to develop a new recycling industry). HWRC and Bulky Waste services may need to be reconfigured such that donation of reusable products (i.e. those not requiring any preparation to be fit for re-use) is made a focus at the point of entry, or donation, so as to prevent them ever being

[%20Loss%20and%20Waste.pdf](#) and

http://www.wrap.org.uk/sites/files/wrap/West%20London%20LFHW%20Impact%20case%20study_0.pdf

³² Current the 4 Rs centre closes at 4pm on the Friday whilst the HWRC is open for the weekend

³³ <http://crni.ie/wp->

content/uploads/2017/02/crni_white_paper_on_environment_and_social_policy_070916.pdf

classified as waste³⁴. Re-use credits to providers of services could be used to incentivise businesses and enterprises that engage in preparation of re-use, recognising any costs that might be avoided by the Council in not having to dispose of items (these have been used by other local authorities)³⁵. Another way to prioritise re-use could be an extension of the Council’s binovation app to encourage donation for re-use ahead of recycling / residual by linking up residents to donation points.

It is worth noting that strong repair networks can become important in facilitating new business models on the part of businesses, both large and small. If businesses look to enter into agreements based not on outright ownership of a product, but on paying for the service the product provides, then a move to the design of items with longer-life makes more sense, but such a move is also facilitated by the necessary skills in repair and refurbishment of longer-life items (and parts) when they do fall in need of repair.

Policy 11: The Council will utilise re-use centre skills to run repair and re-use workshops for residents and a permanent repair cafe, with possible further extension into businesses.

Staff who are skilled in repair and preparation for re-use could be used to run repair and re-use workshops to give residents the opportunity to repair their own items and keep items in use as long as possible. The establishment of permanent repair cafes, rather than pop up events, may provide the most effective way of promoting repair: for enhanced social benefits, this could include intergenerational workshops focused on sharing repair skills. This could utilise volunteers as well as staff trained in repair skills. An example of a successful permanent fixture on re-use is the Rediscovery Centre in Dublin³⁶ which supports four social enterprises engaged in re-use.

Policy 12: The Council will commit to using only re-usable products at public events run by the Council, potentially using Deposit Return Schemes at events to reduce litter.

Policy 13: The Council will seek to re-use furniture in Council owned buildings and design Council buildings for modularity / second life. See also 6.4 on green procurement.

Policy 14: The Council will look at developing networks of merchants to act as re-use hubs for small construction firms (wood, piping, cabling, etc.)

³⁴ A practical point in developing better uptake of the current service would be improved synchronisation of the 4 R’s opening times with HWRC’s. Currently whilst Pennyburn HWRC is open over the weekend the 4 Rs Reuse Workshop is closed.

³⁵ <http://www.wiseuptowaste.org.uk/businesses/reuse-and-recycling-credits>

³⁶ <http://www.rediscoverycentre.ie/research/>

Whilst there are a number of sustainable events guides at present within the UK, there is minimal mention of re-usables, with most focusing a level lower in the hierarchy on recyclability of items. In some major cities overseas, such as Vienna, events are required to make use of reusable items of crockery and cutlery, and they make use of reusable cups, using a deposit refund system to ensure they are returned at the end of the event, or the 'event season' (since attendees can use the same cup at different events). These cups are usually distinctively branded with attractive artwork, and have become collectors' items (so some residents never return their cups).

At Council run events, and those requiring Council permission, reusables ought to be mandated, and a deposit return scheme used for re-usable plastic cups, which ensures the return of the reusable, or if the item is kept, ensures costs are covered. This requires the Council to contract with suppliers of, or supply itself (different cities use different approaches), the required reusable equipment and washing equipment. The use of such a scheme would have notable benefits on the litter clear up process as well as reducing the volume of waste produced from the event.

Where the Council is procuring furniture, re-use should be prioritised as a cost-effective way of using existing resources, either within the Council itself or from other sources, likewise where the Council has the opportunity to design buildings, their potential for re-purposing and, longer term, re-use, should be made a requirement for contractors carrying out such work. This would mean that reconfiguring buildings would be made less wasteful, and the buildings would become more flexible.

One particular area of interest for re-use is for construction firms that use large quantities of material which have the potential for re-use. Small construction firms can be facilitated to re-use materials, working collaboratively to overcome barriers to re-use, such as storage space and mismatches in surplus and demand: a similar scheme operates in Wales³⁷.

³⁷ <http://www.cewales.org.uk/current-programme/surplus-centre-re-use-hubs/>

6.3 Review of Kerbside Collection Approach and Material Value Attained

Policy 15: The Council will use a kerbside collection system and Household Waste and Recycling Centres which collect high value resources and represents best value for the Council.

Policy 16: The Council will restrict residual waste (kerbside and HWRC) to effectively drive increased recycle and organic captures. [Set target of reducing residual waste to <150 kg/inhabitant/year by 2030 from present position of ≈300 kg.]

Policy 17: The Council will prioritise high quality dry recycle suitable for local reprocessors. [Set target of keeping at least 70% of material for reprocessing locally.] See Policy 29 on reprocessing market.

As demonstrated within the current captures diagram (Figure 2), significant scope remains in Derry and Strabane to move recycle and organic wastes out of the residual waste stream and towards the intended collection routes, with consequent financial benefits for the authority. The potential benefits of changing system have been estimated, in this work, as up to £860k a year once fully implemented or £14 per household³⁸. This can be effectively achieved via a change in kerbside collection system (noting a need to tie in with HWRC policies), particularly, the restriction of residual waste collection, coupled with the types of education of, and communication with, residents referred to above. By reducing residual waste, the modelling indicates a reduced cost of residual waste treatment and collection of ≈£50-£60m to DCSDC over 25 years³⁹, or ≈£3m year (£49/hhld) once fully implemented.

The Council should set targets for residual waste reduction - to less than 150kg / inhabitant / year - supported by interim targets, with progress monitored and reported upon. This target will be supported by measures such as the full roll out of food waste collections, restrictions on residual waste, and improved HWRC performance, which will drive up recycling rates, and by the activities identified above regarding re-use, all of which will reduce residual waste.

For recycles currently collected, DCSDC pays a contractor outside the area for its sorting, and see no value returned from the materials collected, of which >90% is exported from Northern Ireland. Changing from the existing system to one where materials are collected separately, and where there is minimal need for additional

³⁸ Scenario 2 in 2029/30 total recycling collections incl. material values difference to baseline of £861k for 60,174 households

³⁹ Noting that there will be a £6-8m increase in food waste treatment costs as food waste moves from residual to dedicated separate food waste collections

sorting, will enable the Council to generate more jobs in the collection service, collect higher quality secondary materials, and render it more likely that the material will be reprocessed locally. It's recognised that any change will require detailed planning and be subject to a cost benefit analysis including a systematic assessment of the monetised value of social (jobs) and environmental benefits (e.g. Eunomia's BPT), taking account of the costs of switching or amending collection systems against potential revenue / quality benefits. A recent scoping study on a Collaborative Circular Economy Network (CCEN) funded by Invest NI⁴⁰ found there to be a clear demand, and need, from local reprocessors for more recycle from household collections in Northern Ireland. The main barrier to meeting this demand was identified as quality, with each reprocessor reporting that in their experience, the level of contamination in co-mingled collection systems, such as the one operated by DCSDC, was unacceptable, whilst collections derived from on-vehicle sorting systems met the quality requirements. The benefits of keeping material locally include retention of value added within the local economy, and associated employment gains, aligning with Circular Economy principles. The CCEN report identified up to £160m in benefits to NI from increasing separate collection of just three materials assessed (plastic, glass and paper) and the safeguarding of 700+ jobs⁴⁰.

If procuring in a way that social value is incorporated (see [Green Procurement](#)), then outcomes should be weighted towards prioritisation of local employment. The impending Social Value legislation for Northern Ireland will formalise the requirement for social value to be considered in public procurement⁴¹. In recognition of the benefits of keeping material locally, the Council should deploy mechanisms to prioritise local reprocessing (contract specifications and / or incentives, or through retaining some control over materials). This will increase the likelihood of the re-shoring of some capacity for reprocessing, generating new businesses and jobs. Not only is there an opportunity to re-shore reprocessing capacity with consequent benefits, there is also a clear opportunity for Derry and Strabane, given the port within the area, to be able to import secondary materials for reprocessing and generate new businesses in reprocessing of materials which are currently recycled at low levels, or which are only now emerging in the waste stream. As an example, there is no paper mill within Northern Ireland but new technologies are available for "small batch" reprocessing that could be used to re-shore capacity for some fibre processing⁴². Higher value electronics may offer another import opportunity if Derry and Strabane can upskill in refurbishment of these items (see [re-use policies](#)).

⁴⁰ http://www.brysonrecycling.org/images/uploads/general/CE_Scoping_Study_-_Final_Report_-_desensitised_.pdf

⁴¹ Northern Ireland is due to receive its own Social Value legislation
<https://www.socialenterpriseni.org/sites/default/files/tenders/Social%20Value%20Act%20Position%20Paper%20310117.pdf>

⁴² <http://ecorglobal.com/closed-loop-ecor-panels/>

Policy 18: The Council will prioritise prevention of food waste (Policy 6).

Policy 19: For any food waste created the Council will seek to increase food waste captures in excess of 60% through communication / education (Policy 1), and quality service delivery.

The presence of food waste in householders' waste represents not just a cost in treatment (whether separately collected food waste or residual), but also a financial loss to householders. Education on food waste prevention, including the potential financial benefits, should be prioritised over and above messages to recycle food waste. For any food waste that is produced (e.g. unavoidable tea bags, egg shells etc.), capturing this in dedicated food waste collection should be prioritised due to the reduced environmental and financial costs, and the creation of a useful organic output which can be used in local agriculture and low carbon energy if treated by anaerobic digestion. The removal of food waste from the residual stream is important for further service optimisation through reducing the frequency of refuse collection: this will not be popular unless there is a convenient collection service for food waste, enabling the odorous food waste fraction to be kept out of residual waste. Capturing food waste effectively will also increase the captures of marketable recyclate from residual waste by making extraction of useful recyclate more straightforward (for a drier stream).

Policy 20: The Council will maximise recyclate extracted from residual waste at kerbside and HWRC.

Whilst there is still recyclate in residual, the Council should have a 'second bite at the cherry', seeking to extract metals, plastics and some paper and card remaining in residual waste.

Policy 21: The Council will not enter into any residual waste contract which compromises ability to achieve its Zero Waste goals.

In order to maintain the drive towards Zero Waste, the way in which the Council contracts for the management of residual waste has to ensure that the contract does not undermine, at any point, the drive towards minimising residual waste.

Policy 22: The Council will track refuse and recycling from collection to end destination to ensure transparency and that materials are managed in a way aligning with Circular Economy principles.

As a supporting measure around waste management the Council should track recycling and refuse collections to check materials are managed as expected, electronic tracking of refuse and recycling collection vehicles from collection to end destination is a cost-effective method to do this.

Information on end destinations should be communicated to residents to underscore public confidence in the culture shift and increase engagement via the assurance that items placed into recycling collection are recycled into new products. Where material is retained locally, this can provide further behavioural drivers for residents to recycle and support the local economy. In Wales, local authorities are now required to report final destinations of recycled materials to understand how recycled materials are used in Wales and monitor improvements⁴³.

6.4 Green Procurement

Policy 23: The Council will extend the use of green public procurement criteria to all purchasing activity with a view to embedding the principles of the Circular Economy throughout the Council. This will include the opportunity for product service models based on the whole life cost of the service delivered and incorporating the principles of The Social Value Act.

The Council is a major procurer of services and embedding green procurement principles within Council procurement will both reduce the Council's direct impacts and demonstrate commitment to a Zero Waste Circular Economy. To focus on waste prevention, before any procurement, the Council should first consider whether procurement is really needed: for example, could procurement of furniture be avoided through re-use of existing items within the Council?

Where procurements are needed, green procurement criteria should be included so the Council can use its purchasing power to stimulate a more Circular Economy. Examples of procurement criteria that could be enacted towards a Zero Waste Circular Economy include:

- recycled content of any goods procured;
- products designed for re-use or recycling;
- eco-design criteria;
- monetising carbon for procurement duration;
- collaborative / innovative approaches to influence the market towards circular principles;
- social value criteria, Northern Ireland is due to receive its own Social Value legislation which would formalise this⁴⁴;

⁴³ http://gov.wales/topics/environmentcountryside/epq/waste_recycling/publication/end-destinations-review/?lang=en

⁴⁴ Northern Ireland is due to receive its own Social Value legislation
<https://www.socialenterpriseni.org/sites/default/files/tenders/Social%20Value%20Act%20Position%20Paper%20310117.pdf>

- specifying limits on the quantity of waste produced and how it is to be handled, for example stating % waste which will be recycled or kg / employee residual waste limits or other relevant metrics; and
- durability and reparability criteria;

Where relevant, the achievement of these criteria should be accompanied with KPIs and reported against throughout the procurement duration. With public sector procurement often weighted towards economic costs, one way to rebalance towards Circular Economy is to ensure that goods and services are procured based on total cost of ownership. Products that have been designed for re-use and ease of disassembly may last longer because they are more easily repaired, and may have a higher end-of-life value. In recognition that providers of innovative goods and services designed towards Circular Economy are sometimes smaller, the Council should offer support to SMEs and third sectors organisations bidding on Council procurements.

Policy 24: The Council will incorporate green criteria into the Council planning system and any construction owned by the Council. Consideration will be given to setting targets for re-use / recycling of demolition and construction wastes. See also policies on re-use.

The construction industry produces the greatest volume of waste of any industry, and as the Council is responsible for local development planning⁴⁵, and a procurer of construction services, DCSDC has a key opportunity to influence the waste produced and also the longer-term circularity of the buildings constructed (e.g. energy efficiency, opportunity for re-use). This could be achieved via stating green criteria in the planning system and / or the use of Refundable Compliance Bonds. Such bonds have been used in California as a means to encourage high rates of re-use and recycling: contractors commit to a level of re-use and recycling on their site, and they surrender a bond at commencement. If they achieve their targets in full, they are refunded their bond, minus an administrative fee, but if they fall short, they receive only a proportion of the bond in return.

The existing sustainable planning guide for Councillors⁴⁶ already makes reference to the competitive advantages from reducing waste and energy, and re-use is cited in the Local Development Plan in relation to historic industrial buildings and sites⁴⁷, but this needs further extension to other Council owned buildings. There are many existing policies / tools for greening buildings, such as Simplified Building Energy Model (S-BEM), but many of these focus on energy use rather than waste and re-use. The Council should therefore

⁴⁵ <https://www.planningni.gov.uk/>

⁴⁶ <http://www.nienvironmentlink.org/cmsfiles/Places-for-People---Derry-City--Strabane.pdf>

⁴⁷ <http://www.derrystrabane.com/getmedia/e3a66ca9-4f31-4e31-b942-f0b9886c80bd/EVB-10-Urban-Design.pdf>

look to incorporate its own specific clauses linked to a Zero Waste Circular Economy within any policies on constructing / managing buildings.

Policy 25: Publicly run canteens (schools etc.) will redistribute edible surplus food wherever possible.

As a major procurer of services, including food services, the Council is in a position to redistribute any edible surplus food arising within its operations with social and environmental benefits. Food service businesses are already legislated to separate food waste for recycling (where producing >5kg/week), but in accordance with the waste hierarchy food waste prevention should be the primary aim, with redistribution to those in need the next best option where edible food waste does arise. Whilst this may require some resources to operate (e.g. proper storage of food for redistribution, transport, logistics etc.), the evidence shows the benefits far outweigh the resources required. Based on analysis by FareShare NI, for every £1 spent on food redistribution there is a social and economic return of £8⁴⁸.

6.5 Circular Economy Business Support and Circular Economy Innovation

Policy 26: The Council will undertake a strategic review of opportunities for the Council to increase the ability of businesses to prepare for re-use and recycle.

Policy 27: Designated advice, loan or funding mechanisms for local businesses to resource shifts towards Circular Economy business models will be established.

Policy 28: The Council will embed Zero Waste Circular Economy principles into any economic development plans and business funding offered.

Circularising the businesses in the area requires communication regarding the benefits to be gained (see [behaviour change policies](#)) and supporting businesses to grasp opportunities. The Council can support businesses in the shift towards a Zero Waste Circular Economy. Resourcing and change process can be a barrier, particularly for SMEs, which dominate in Derry and Strabane⁴⁹.

On the waste management side, the Council could undertake a strategic review of the market for commercial waste collection, to ensure commercial businesses have the opportunity to recycle wherever possible. At present, the Council offers a commercial

⁴⁸ [http://www.chni.org.uk/CHNI%20FS%20SROI_v2\(2\).pdf](http://www.chni.org.uk/CHNI%20FS%20SROI_v2(2).pdf)

⁴⁹ Based upon UK UKBAD01 dataset of the 10,810 businesses in Derry City and Strabane in 2013, 99.77% had less than 250 employees.

service, but the service has relatively few customers: thus, there is a potential opportunity to offer a more commercial service, prioritising recycling and generating additional revenue for the Council to support other services, particularly if high quality recyclate can be collected. Moving businesses towards higher recycling rates provides a first step towards a Zero Waste Circular Economy, which for many businesses may be relatively easy ahead of more challenges higher up the waste hierarchy.

To facilitate a joined-up approach and commitment across the Council, any economic development plans should make reference to the Zero Waste Circular Economy strategy, and principles should be embedded into corporate strategy across every department, highlighting the economic benefits. This should include training Council employees on the culture change and attitude shift required at all levels, particularly those involved in procurement. Where the Council is supporting businesses, support should, within reason, be dependent upon businesses acting upon Circular Economy opportunities. Any existing business support, for example Strabane Business Hub, should embed principles for the Zero Waste Circular Economy strategy.

The use of a web portal could provide an efficient way to communicate information for businesses on moving towards a Zero Waste Circular Economy.⁵⁰

Existing organisations which are working on Circular Economy opportunities for businesses in the area include: Business in The Community Northern Ireland (BITCNI), Industrial Symbiosis⁵¹ and WRAP Northern Ireland. The Council should draw on this expertise to expand its capacity to offer specialist support to local businesses and SMEs to overcome resource constraints. These actions outline ways the Council can use its powers to enact a more Circular Economy within local businesses, despite having less direct control than over businesses than householders.

Policy 29: The Council will encourage development of local markets for materials where there is not currently local reprocessing capacity for secondary materials. See also Policy 15 and 17.

Policy 30: The Council will support businesses in the redistribution of edible surplus food.

⁵⁰ Derry’s cultural community have developed a dedicated online protocol to accelerate online collaboration in the council area. There may be opportunities to investigate adapting the protocol to accelerate the dissemination of circular economy practices.

⁵¹ The Industrial Symbiosis service is delivered by International Synergies NI Ltd on behalf of Invest NI.

At present much of the Council's recyclate is exported, if high quality material is collected then, as outlined in the CCEN report⁵², there is a clear opportunity for developing local capacity for reprocessing secondary materials. The Council could provide support for the development of local reprocessing.

This keeps benefits of quality material collected locally and provides new business opportunities. This could also incorporate more "difficult" waste streams collected at HWRCs, such as mattresses, which USEL, a social enterprise based in Belfast, disassembles into various components which are processed and re-used⁵³.

Another opportunity is for the Council to support agri-food businesses in the redistribution of edible surplus food. As quantified for Policy 25, the economic and social returns on investment from redistribution of surplus food are high and there is significant opportunity within the agri-food sector for redistribution. The Council could help support agri-food businesses to overcome barriers such as storage, transport and logistics to ensure edible surplus food within Derry and Strabane goes to those in need rather than for recycling⁵⁴.

Policy 31: The Council will establish a Think and Do Tank to support the strategy and define ongoing Council commitment to support. It will define clear terms of reference for the operation of the Think and Do Tank.

The formation of a "Think and Do Tank" is a core outcome of this strategy. This Think and Do Tank would go wider than Council's remit and draw in expertise locally, at the national level, and beyond, and should focus upon innovations to further support the Zero Waste Circular Economy Strategy for Derry and Strabane. The Think and Do Tank should aim to build upon existing best practice, knowledge and research and take a collaborative approach to avoid the duplication of efforts elsewhere.

The Think and Do Tank should be driven by an advisory panel of experts drawing upon global best practices. Drawing on strategies used by successful organisations elsewhere, for example The Scottish Remanufacturing Institute, or the work of Zero Waste Scotland, will help make best use of the Think and Do Tank's resource. There are a number of existing organisations likely to be willing to support the Think and Do Tank, and support for this initiative was evident at the Roundtable event which informed this strategy. Engagement of stakeholders who can see innovations through to implementation is crucial. Universities, with existing, or closely related, capacity in the Circular Economy, can provide a valuable resource for the Think and Do Tank. The Think and Do Tank

⁵² http://www.brysonrecycling.org/images/uploads/general/CE_Scoping_Study_-_Final_Report_-_desensitised_.pdf

⁵³ <http://www.sustainableireland.co.uk/riverridge-acquires-wastebeater-recycling/>

⁵⁴ https://www.derbyshire.gov.uk/social_health/health-and-wellbeing/your-communities-health/making-health-fairer/feeding_derbyshire/default.asp

should draw upon the Council’s partnership with Donegal using regional development platform as there is likely to be joint opportunities.

Policy 32: Carry out residual waste composition analyses of household and business waste to identify components present, and what solutions there are to manage these in line with Zero Waste Circular Economy principles, and to identify opportunities for the Think and Do Tank.

Policy 33: The Think and Do Tank will work with prominent industry sectors in Derry and Strabane on “circularisation plans” identifying Zero Waste Circular Economy opportunities by sector.

Policy 34: The Think and Do Tank will carry out a resource mapping exercise.

Whilst the early stages of the strategy will focus on the “significant wins”, which are well established, and evidenced waste management steps for reducing residual waste and increasing recycling, the Think and Do Tank will focus upon driving Circular Economy and innovations higher up the waste hierarchy, such as different business models and redesigning products to reduce waste. Specific areas the Think and Do Tank could take action on include:

- Work with sector representatives to develop sector specific circularisation plans, embedding these into any strategies and identifying opportunities for growth, the basis of which is outlined in section 5.0.
- Designing out residual waste (potential to utilise education institutes for research and Northern Ireland Design Alliance)
- Resource mapping exercise supported by engaging business-to-business approach to match materials with users (potential to utilise expert partners such as Industrial Symbiosis and BITCNI).

These areas of work would be supported by waste composition analyses to understand where the opportunities lie. These actions need to be “sold” to businesses and agencies so they buy into the opportunities and understand the wider economic, social and environmental benefits of making best use of resources rather than having actions imposed upon them. The Think and Do tank can provide a framework to bring together organisations to collaborate on Circular Economy, for example bringing businesses together with expertise and solutions. Linking in with section 6.1, the Think and Do Tank could also work on novel approaches to behavioural change, shifting attitudes away from consumerism towards re-use. For problematic items such as polystyrene, plastic disposal cups, the Think and Do Tank could work on specific campaigns to design out / avoid. It could also fund pilot projects to demonstrate “proof of concept” of promising innovations ahead of businesses scaling up.

Policy 35: Identify funding streams to ensure longevity of the Think and Do Tank.

To be successful, the Think and Do Tank needs to be adequately funded. There are a number of possible funding sources which the Think and Do Tank could draw upon including:

- **European Regional Development Fund (ERDF):** programme focused on improving Northern Ireland's sustainable economic growth and could be used to support Circular Economy, for example the ERDF part funds the Circular Economy Investment Fund in Scotland. Note the time critically of securing this funding with the UK's departure of the European Union by 2019 and that these are administered at national level for Northern Ireland by the Department for Economy.
- **Northern Ireland:** whilst ministerial sanction is required to direct or approve funds, based upon previous funding streams, such as the Rethink Waste Fund, and interest in Circular Economy in the industrial strategy consultation, it seems likely activities conducted by Think and Do Tank could be eligible for future national environmental funds.
 - Invest Northern Ireland currently has an open call for funding on water, waste and energy; resource efficiency capital grants; available to help the Council and its business clients in the district.
 - Big Lottery Fund Empowering Young People £50m funding with application deadline 31st March 2021⁵⁵
 - Northern Ireland government departments of relevance - Department of Finance (who administer EU Structural and Investment Funds), Department of Communities, Department of Agriculture and Environment and Department of Economy. The Draft Department for Economy Industrial Strategy for Northern Ireland makes reference to a Circular Economy Strategy joint with DAERA and this may be accompanied by funding opportunities.
- **Ellen MacArthur Plastics Fund:** A \$2m fund for rethinking use of plastic packaging. One example of a specific fund which may be of relevance to the Think and Do Tank depending upon the priorities set.

In acquiring funding for the Think and Do Tank, it is important to be transparent and avoid any conflicts of interest. Within reason, without compromising the core purpose of the Think and Do Tank, there should be consideration of funding criteria / areas when defining the programme for the Think and Do tank so as to increase chance of being funded. These funding streams could also be leveraged to support other areas of the strategy beyond just the Think and Do Tank.

⁵⁵ <https://www.biglotteryfund.org.uk/empowering-young-people>

6.6 National Influence

Policy 36: The Council will use its position to lobby for national legislative support for Zero Waste Circular Economy strategy.

Policy 37: Where specific packaging is identified as breaching The Packaging (Essential Requirements) Regulations, and is misaligned with the Zero Waste Circular Economy Strategy, The Council will issue formal complaints via the Department for Economy.

Many of the measures for Derry and Strabane would have enhanced prospects if supported by changes in national legislation (although it is important to note that the policies listed here are within the Council's competence, and national legislation should in no way present a barrier to the policies outlined). The Council should play a role in lobbying relevant government departments and agencies, including DAERA and Department for Economy, for the introduction of policies and financial arrangements which support the delivery of this Strategy. One specific area of lobbying is in packaging, if packaging is in breach of The Packaging (Essential Requirements) Regulations 2015 then DCSDC could issue a formal complaint to producers using Department for Economy as the designated enforcement authority.

If certain national legislative constraints are identified to achieving the strategy, the Council could tap into local government through bodies such as NILGA to address issues, these issues may include procurement rules or producer responsibility.

The Council should lobby for high level political support from national bodies and government departments to support Zero Waste Circular Economy principles. Examples of this include: the inclusion of Zero Waste Circular Economy principles in the Programme for Government for the new Executive: this is not included at present; and challenging funding requirements specifying 'export only' businesses. NIEA has iterated its commitment to support Councils on a compliant waste sector and the promotion of resource efficiency to reduce waste created⁵⁶. the Council should lobby NIEA where required to ensure effective enforcement provides the necessary drivers towards Zero Waste Circular Economy, not least as the industrial strategy unfolds.

⁵⁶ <https://www.daera-ni.gov.uk/sites/default/files/publications/daera/NIEA%20Business%20Plan%202016-17.PDF>

7.0 National Support

The policies listed above for the council could be enacted into national policy to bring about transformative change for Northern Ireland. In addition, there are a number of specific national policy suggestions to support this strategy that are either outside of DCSDC powers or could be made most effective with national support. These are listed below:

- Implement pay as you throw systems for households to deter the production of residual waste, which is likely to encourage waste prevention, re-use and recycling;
- introduce deposit refunds for beverage containers (and consideration of a similar scheme for small WEEE to increase recycling). There may be potential for an all-island scheme if current discussions in the Republic of Ireland lead to a decision to implement a scheme there;
- implement a central electronic duty of care system;
- provide greatly improved data on C&I and CD&E waste, allowing the effect of Circular Economy measures to be monitored more effectively;
- provide financial and technical support on trials and R&D demonstrating the business case for Circular Economy practices;
- overhaul producer responsibility for WEEE to facilitate improved design, collection and management of WEEE, and incorporate re-use targets;
- introduce producer responsibility requirements for furniture, including re-use targets;
- require supermarkets to offer excess food to food redistribution organisations (e.g. FareShare NI);
- introduce a requirement to sort (fractions of) commercial waste, as in Scotland;
- review national bio-waste treatment infrastructure in Northern Ireland to ensure there is sufficient capacity to meet demand. This is supported by the Northern Ireland Biogas Research Action Plan 2020; and
- national Agri-Environment schemes supporting the use of digestate.

8.0 Implementation

Once the strategy and policies are agreed, a route map should be developed which outlines detailed actions, the planned timing of these, who is accountable and stage-gates to monitor progress. New working relationships and practices will be required in order to ensure success, including in the context of procurement and with partners such as trade unions. An inclusive approach to the iteration of the implementation route map is strongly recommended if issues such as path-dependency and infrastructure lock-in are to be anticipated and avoided. For some policies, existing reporting frameworks can be used (e.g. waste data flow), for others there will need to be new reporting methods and Key Performance Indicators (KPIs) defined, some of which are already suggested

here. The use of a route map with a monitoring system, stage-gates and clear accountability will ensure successful implementation of the agreed strategy.

9.0 Conclusions

In line with the original objective of answering the questions of whether the “introduction of a circular economy / zero waste strategy within the Council area is technically feasible, economically viable, sustainable and presents value for money in terms of any investment made by Council in the project”, based upon the research done Eunomia recommends that a Zero Waste Circular Economy for Derry City & Strabane is achievable and has the potential to yield significant economic, social and environmental benefits in line with the Council’s community planning thematic pillars.

A.1.0 Modelling Conducted

Table 3: Scenarios Modelled

	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Kerbside Residual	Increasing restriction of residual waste*	Increasing restriction of residual waste* incl. eventual switch to bags	Increasing restriction of residual waste*	Increasing restriction of residual waste*
Kerbside recycling	As baseline	Switch to kerbside sort	Switch to kerbside sort	Switch to kerbside sort
Kerbside garden	Introduction of charged for system			
HWRC	Enforcement of Council's black bin bag phase out residual waste to raise recycling to 80% followed by further improvements to drive to 90% recycling. Incl. Preparation for re-use of readily re-usable materials.			
Home Composting and Reusable Nappies	Introduction of subsidised home composting and reusable nappies initiatives, timed to support households in transition to restricted residual.			
Residual Treatment	As baseline	As baseline	As baseline	Use of MBT
Notes	<p>* Scenarios include a step change towards these configurations, particularly for the residual waste restriction, only the final 2029/30 configuration is illustrated here. Scenario 1 Scenario 2 immediately switches recyclate collections and begins 3W in 2019/20 and sacks in 2029/30. Scenario 3 Switches recyclate collection and to 3W residual simultaneous in 2022/23 and Scenario 4 is the same as Scenario 3 but with the addition of MBT for residual treatment.</p> <p>As per regulations food waste is separately collected in all scenarios.</p>			

Figure 3: Pictogram illustration of final 2029/30 kerbside scenario.































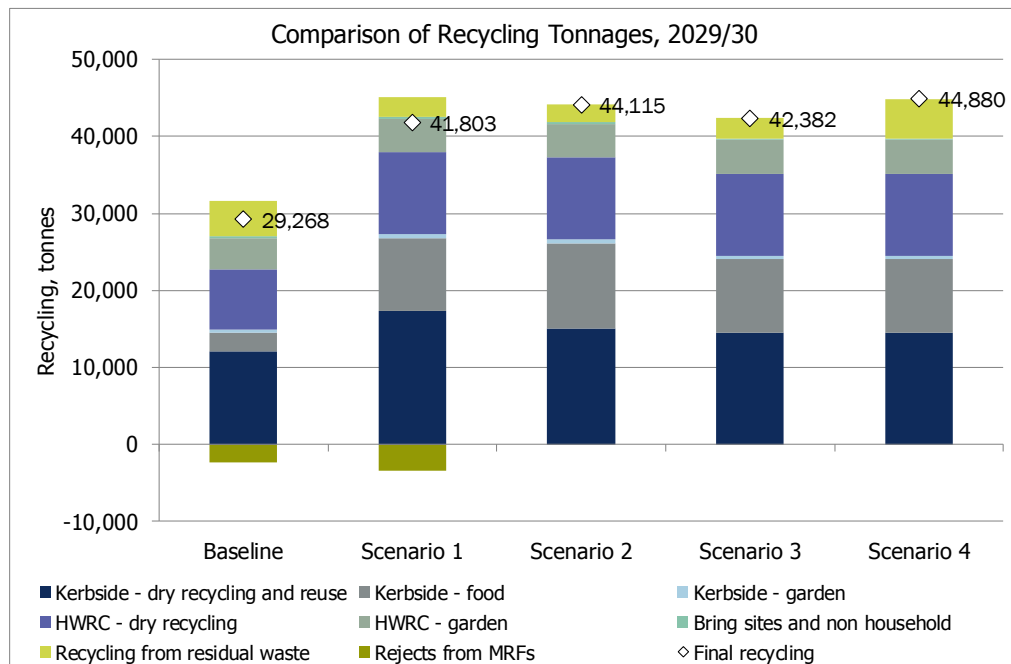
	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Recycling	Fortnightly 	Weekly 	Weekly 	Weekly 
Food Waste	Weekly 	Weekly 	Weekly 	Weekly 
Garden Waste	Fortnightly 	Fortnightly 	Fortnightly 	Fortnightly 
Residual	3W 	3W - clear sacks 	3W 	3W 
Treatment	As baseline	As baseline	As baseline	MBT 
Vehicle Passes	Scenario 1 Fortnightly 	Scenario 2 Weekly 	Scenario 3 Weekly 	Scenario 4 Weekly 
	Weekly 			
	Fortnightly 	Fortnightly 	Fortnightly 	Fortnightly 
	3W 	3W  no bin lift	3W 	3W 

Figure 4: Annual Recycling Tonnes by Scenario in 2029/30



Recycling rates are: Baseline (BL) 43%, Scenario 1 63%, Scenario 2 71%, Scenario 3 67% and Scenario 4 70%.

Table 4: Material collected by scenario over 25-year period (cumulative total and difference to baseline)

Scenario	Recyclate (tonnes)		Food Waste (tonnes)		Residual Waste (tonnes)		Garden Waste (tonnes)	
	Total to 2040	Diff from BL	Total to 2040	Diff from BL	Total to 2040	Diff from BL	Total to 2040	Diff from BL
BL	727,804		60,609		1,088,179		8,508	
1	1,003,534	275,730	209,079	148,470	705,767	-382,412	11,726	3,218
2	1,046,995	319,191	236,269	175,661	577,843	-510,336	12,403	3,895
3	1,003,680	275,877	200,044	139,435	665,104	-423,075	11,876	3,368
4	1,051,472	323,668	200,044	139,435	617,312	-470,867	11,876	3,368

Figure 5: Annual Financial Cost Savings Compared to Baseline by Scenario in 2029/30

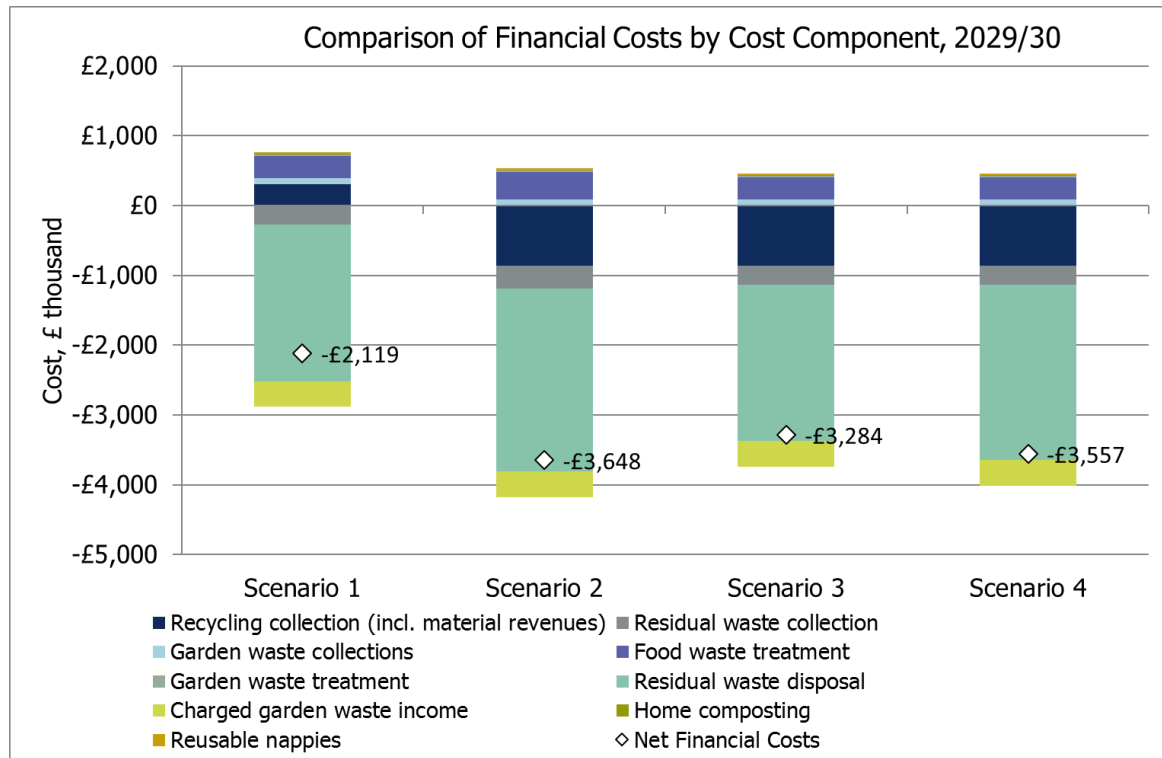


Table 5: Cost difference from baseline over 25 years (-ve = saving)

Scenario	Recyclate	Residual Waste	Food Waste	Garden Waste	Prevention Initiatives	Total
	Diff from BL (£k)	Diff from BL (£k)	Diff from BL (£k)	Diff from BL (£k)	Diff from BL (£k)	Diff from BL (£k)
1	£6,269	-£54,506.94	£6,681	-£5,952.70	£751.36	-£46,758
2	-£20,612	-£61,879.48	£7,905	-£6,081.58	£827.94	-£79,840
3	-£16,452	-£51,515.72	£6,275	-£4,864.04	£751.36	-£65,806
4	-£16,452	-£56,727.93	£6,275	-£4,864.04	£751.36	-£71,018

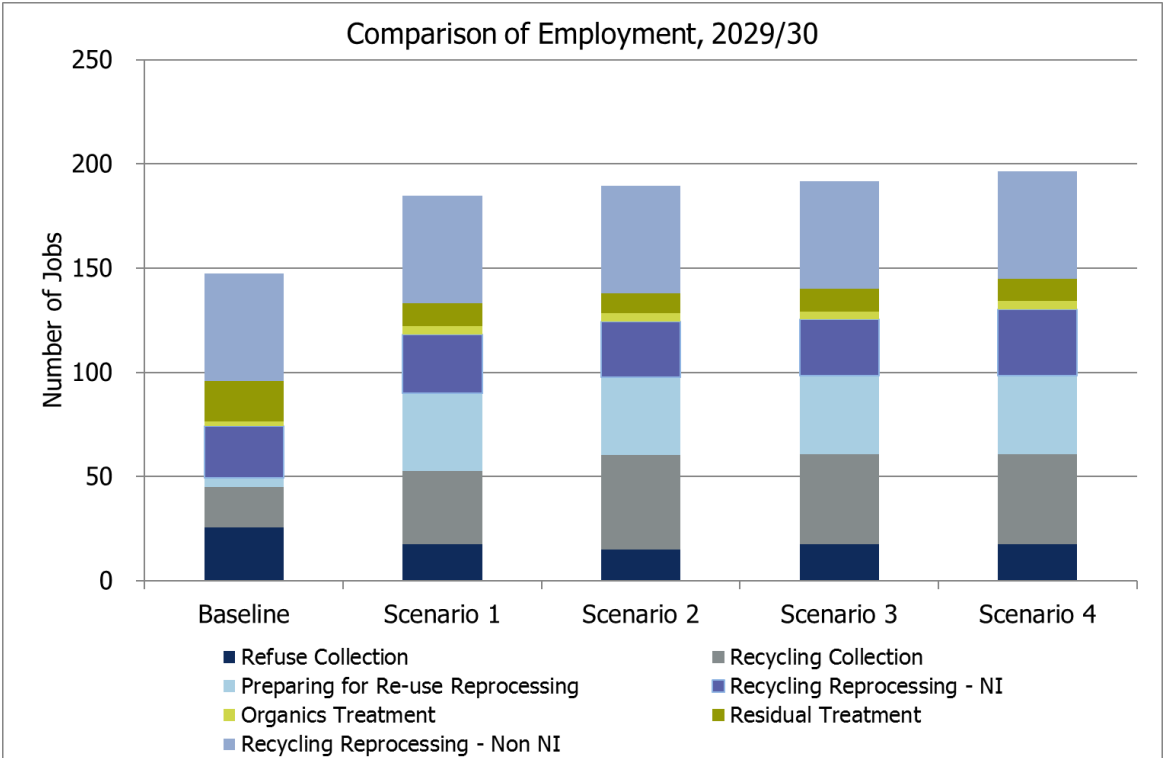
Prevention initiatives includes costs only, benefits seen in residual waste reduction

Table 6: Cost difference from baseline 2029/30 (-ve = saving)

Scenario	Recyclate	Residual Waste	Food Waste	Garden Waste	Prevention Initiatives	Total
	Diff from BL (£k)	Diff from BL (£k)	Diff from BL (£k)	Diff from BL (£k)	Diff from BL (£k)	Diff from BL (£k)
1	£304	-£2,515.40	315	-£257.53	£34.38	-£2,119
2	-£861	-£2,950.43	386	-£257.53	£34.38	-£3,648
3	-£861	-£2,515.40	315	-£257.53	£34.38	-£3,284
4	-£861	-£2,787.78	315	-£257.53	£34.38	-£3,557

Prevention initiatives includes costs only, benefits seen in residual waste reduction

Figure 6: Number of Jobs by Scenario in 2029/30



Note: Recycling and Reprocessing jobs that are Non-NI at present are most likely to switch to NI jobs in Scenario 2 – 4

Figure 7: Monetised Environmental Costs by Scenario in 2029/30

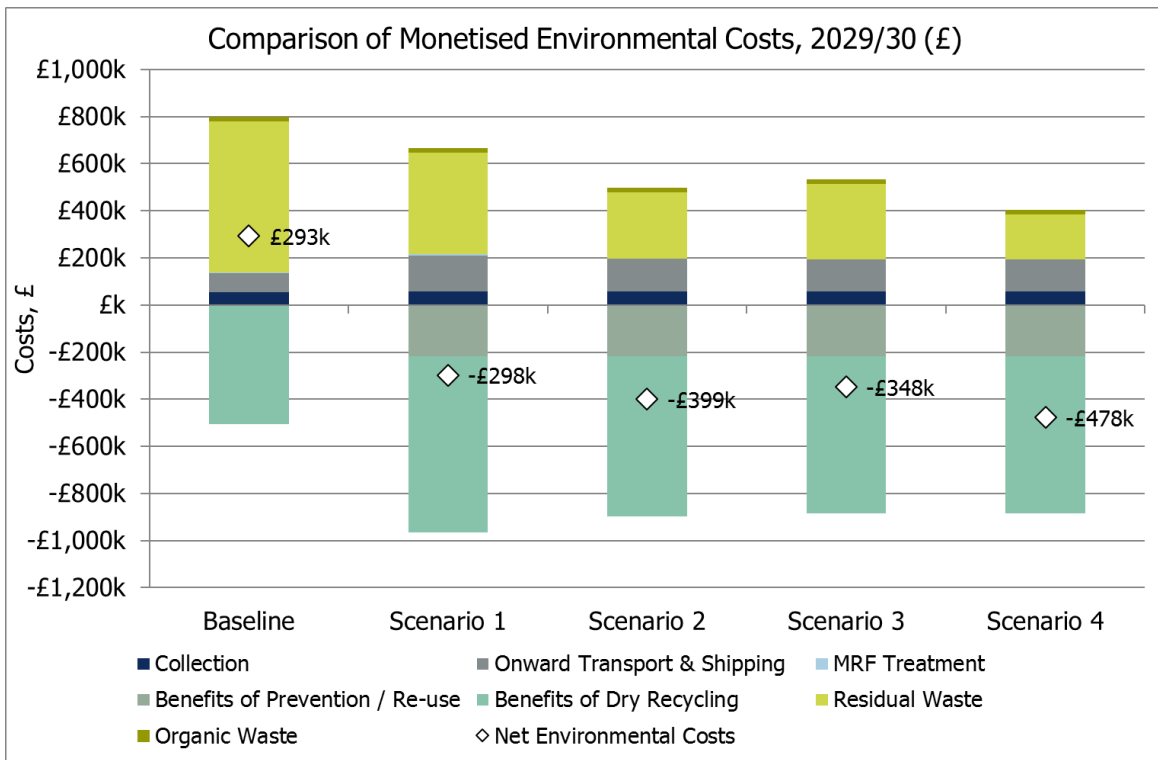
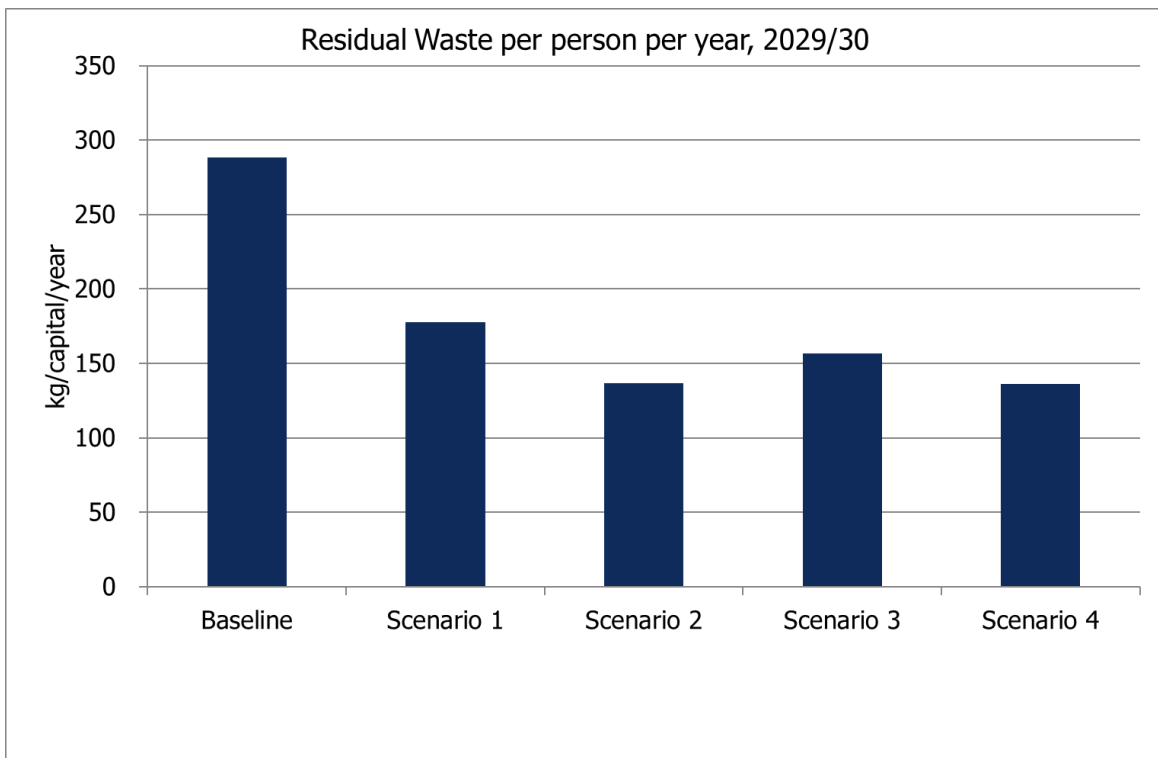


Figure 8: Residual Waste per person by Scenario in 2029/30



A.2.0 Considerations

This section discusses some of the economic, resourcing, infrastructure and capacity building requirements of the changes considered.

Recycling Rates

All scenarios reach the 2020 50% recycling target of recycling but only scenarios 2 and 4 achieve the 70% EU Circular Economy Package recycling target.

HWRC Improvements

Improvements to HWRC staffing, layout and signage can effectively increase recycling rates, usually at minimal cost or cost neutral for the Council. Best practice guidance on operation of HWRCs is available from WRAP, and HWRC policies should reflect these. As the area has a large number of HWRCs for the population, this may include closing smaller sites with poor recycling rates due to lack of staffing and enforcement and investing in clear signage and enforcement at larger, well used sites, to drive recycling rates. These improvements will be required for achievement of the Council's policy of phasing out black bag waste at HWRCs, which is already formalised within the Procedure for Waste Management Services. Policies and targets around re-use at HWRCs need to also be clearly documented including the social, economic and environmental benefits.

Residual Waste Restriction

Restriction of capacity for residual waste at kerbside is proven to be an effective way of driving recyclate and organics into dedicated collection routes and out of residual collections. Residual waste composition analysis indicates this is eminently possible due to the quantity of residual waste which is recyclate / compostable. No specific infrastructure investments are required, although as noted in Policy 21 the Council should not be tied into any residual treatment contracts which contradict the drive for reduced residual. The move to smaller bin sizes can be cost effectively achieved via a replacement policy of replacing with smaller bins. The reduction in frequency of collections will require re-designing of rounds and may result in surplus staff / vehicles. However, this could also represent an opportunity to grow the Council's commercial service and offer quality recycling collections to local businesses. Three weekly collections could be accompanied by a separate hygiene waste collection if this is a major concern to residents and this is an approach adopted by other authorities. Whilst re-usable nappies should be promoted there is likely to still be residents not willing to change their behaviour. Three weekly collections can also lead to concerns around fly tipping, if the Council has a zero-tolerance approach and fly tipping is appropriately tackled (as per Procedure for Waste Management), there is no reason to believe fly tipping will increase. If the Council were to go down the route of residual restriction towards sacks, there would be reduced vehicle costs as bin lifts are no longer required. The Council's policy of no side waste should be maintained so as not to undermine the effectiveness of restricted residual.

Charged Garden Waste Service

At present the Council collects garden waste from certain geographic areas at no charge to householders. There is no obligation for Councils to provide a free garden waste service, and as of 2016, 42% of Councils in Great Britain charged for garden waste with others planning to introduce a charge⁵⁷. To introduce garden waste to more households, the Council should levy a charge to help cover costs. Charged for garden waste services generally run cost neutrally with the service charge covering costs. This expansion of service area covered, combined with the promotion of / subsidies for home composting and restriction of residual should drive garden waste out of the residual waste. Residents will retain the option to take garden waste to HWRCs free of charge.

Co-mingled to Kerbside Sort

At present, the Council operates a co-mingled service with materials being taken by RecyCo from a Waste Transfer Station to a Materials Recovery Facility. The move to a kerbside sort system represents a major shift including new vehicles and containment, communications with residents, retraining of staff and additional staff requirements and a bulking facility for the kerbside sorted material. The vehicles and containment required can be tied into procurement cycles such that new vehicles and containment are purchased once the existing are depreciated. Householder communications will require notable investment but there is no evidence householders should experience lower satisfaction or issue in sorting recycle⁵⁸ after initial implementation. Given the Council's demographics, sourcing additional staff should benefit the local economy and the cost benefit analysis indicates there are significant financial benefits for the Council and wider Council area economy from moving to kerbside sort, despite the challenges involved in a major service shift. Developing markets for the material collected to be used locally may represent a challenge, but as quantified in the CCEN report, there is already market demand for three main materials. Based on modelling conducted, there is a strong business case for moving to kerbside sort system which supports the Council's economic, environmental and social thematic pillars.

Waste Prevention - Home composting and Re-usable nappies

Home composting has significant potential to reduce the quantity of organic waste going to landfill and provide a valuable resource to the householder. Best practices include:

- Compost bins should be distributed on an "opt-in" rather than an "opt-out" or total distribution basis;
- Owners of the bins should be given instruction in how to make and use compost;
- They should have access to support through local advisers, giving face-to-face advice where appropriate;

⁵⁷ <https://mantis.uk.com/garden-bin-tax-how-does-your-council-compare-2/>

⁵⁸ <http://www.wrapcymru.org.uk/sites/files/wrap/Municipal%20Sector%20Plan%20Wales%20-%20Collections%20Buleprint.pdf>

- A helpline or website should be made available to ensure availability of continuous support; and
- Regular contact from the scheme should be provided so that composters can be encouraged to continue composting and to increase the range of materials that they compost. This will require a record of where compost bins have been provided to be maintained.

Reusable nappy promotions typically include one – or possibly a combination – of four activities:

- 1) Information/educational resources;
- 2) The provision of sample packs to allow households to trial different reusable nappies;
- 3) Subsidies/loans to purchase reusable nappies; and
- 4) Subsidies to make use of a local nappy laundry service.

The level of up-take by households will naturally depend on the degree of financial support and extent of promotion.