

Title: Rethinking Our Resources: Measures for Climate Action and a Circular Economy in NI	Regulatory Impact Assessment (RIA)
	Date: 27 November 2023
	Type of measure: Consultation
Lead department or agency: Department of Agriculture, Environment and Rural Affairs (DAERA)	Stage: Initial
	Source of intervention: Domestic
Other departments or agencies:	Contact: Resources & Waste Strategy Team
	wastepolicyteam@daera-ni.gov.uk

Summary Intervention and Options

What is the problem under consideration? Why is government intervention necessary? (7 lines maximum)

The EU Circular Economy Package (CEP), to which the UK had committed prior to EU Exit, was transposed into domestic legislation in December 2020 by The Waste (Circular Economy)(Amendment) Regulations (Northern Ireland) 2020¹. This amended the content of the Waste and Contaminated Land (Northern Ireland) Order 1997² and introduced the following targets:

- 65% of municipal waste prepared for re-use and recycled by 2035 (with interim targets of 55% by 2025 and 60% by 2030); and
- The amount of municipal waste sent to landfill to be reduced to 10% or less of the total amount of municipal waste generated (by weight) by 2035.

The Climate Change Act (Northern Ireland) 2022 has been introduced committing Northern Ireland to achieving Net Zero by 2050 and setting the target for at least 70% of waste to be recycled by 2030. At the Northern Ireland level, 50.1% of household waste collected by councils was sent for preparing for reuse, dry recycling, and composting during 2021/22. There is a natural ceiling beyond which Councils must invest more money in services to increase recycling rates. There is a need for further national steer in policies to instigate financial commitments to implement changes in services and drive increases in recycling. As evidenced in the UK nations, new support and policy measures are needed to help drive the service changes. Furthermore, there is a requirement for greater alignment and consistency of household collection service profiles delivered by NI Councils to realise the environmental benefits from more separation of materials delivered into local NI reprocessors. It is estimated that recycling rates of non-household municipal (NHM) is currently as 40.6% which presents a significant opportunity for improvement but also requires interventions to drive changes in business behaviour towards increased recycling.

What are the policy objectives and the intended effects? (7 lines maximum)

All households would be required to have a 'core set' of separately collected materials to be recycled or composted, with the aim of increasing recycling rates, improving the quality of recyclate produced and ensuring all households have access to the same level of service provision. Maximising the range of recyclables and providing separation within collections reduces contamination, boosting reprocessors' confidence in the quality of recyclate being collected, and increases demand for secondary materials. All businesses generating Non-Household Municipal (NHM) waste would be required to separate dry recyclable material and food waste from residual waste for recycling. These measures will increase both the quantity of materials collected, and the quality of recyclate produced. The requirement to have these services in place would drive organisations to reprofile their schemes to reduce costs at the same time having access to transitional support to make the changes as efficiently as possible.

¹ [The Waste \(Circular Economy\) \(Amendment\) Regulations \(Northern Ireland\) 2020 \(legislation.gov.uk\)](https://legislation.gov.uk)

² [The Waste and Contaminated Land \(Northern Ireland\) Order 1997 \(legislation.gov.uk\)](https://legislation.gov.uk)

What policy options have been considered, including any alternatives to regulation? Please justify preferred option (further details in Evidence Base) (10 lines maximum)

The impacts of different UK best practice requirements for household and NHM waste and recycling collections were considered and combined for the whole municipal sector. A total of 21 scenarios were considered including, reduced residual frequency/capacity, variations of dry segregation and separate/ mixed food waste collections. The following options produced the best cost and performance outputs for Northern Ireland as a whole.

Option 1: 3-weekly or restricted residual, multi stream, separate food, and free garden waste.

Option 2: 3-weekly residual, multi stream and mixed food and garden waste.

Option 3: 3-weekly residual, two stream fibres separate, separate food and free garden waste.

*Options 1-3 also model all businesses in NI generating NHM waste with MDR, separate glass, separate food, and residual collections.

Will the policy be reviewed? It will be reviewed

If applicable, set review date: Month/Year

Cost of Preferred (or more likely) Option

Total outlay cost for business £m	Total net cost to business per year £m	Annual cost for implementation by Regulator £m

Does Implementation go beyond minimum EU requirements?	YES <input type="checkbox"/>	NO <input type="checkbox"/>		
Is this measure likely to impact on trade and investment?	YES <input type="checkbox"/>	NO <input type="checkbox"/>		
Are any of these organisations in scope?	Micro Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Small Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Medium Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Large Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>

The final RIA supporting legislation must be attached to the Explanatory Memorandum and published with it.

Approved by:

Date:

Summary: Analysis and Evidence

Policy Option 1

Description: All households in Northern Ireland to receive a weekly multi-stream dry recycling collection with paper/card, plastics, metals, and glass collected as a minimum. Alongside a 3-weekly or restricted capacity residual (max 180lt fortnightly), weekly separate food and free garden waste collections. All businesses generating household like waste (NHM) to separate waste into mixed dry recyclables, separate glass, and separate food waste collections.

ECONOMIC ASSESSMENT (Option 1)

Costs (£m)	Total Transitional (Policy) (Constant price)	Years	Average Annual (recurring) (excl. transitional) (Constant price)	Total Cost (Discounted to 2026) (Present Value)
Low	£75.59	1	£42.81 mill Optional	£177.28 mill
High	£100.6		£48.12 mill Optional	£206.08 mill
Best	£89.16 mill		£44.84 mill	£197.96 mill

Description and scale of key monetised costs by 'main affected groups' Maximum 5 lines

Local Councils see between £76-101m transition costs because of investment needs in new vehicles, containers, communications, container delivery, project management on infrastructure requirements. Government loses between £40-42m in reduced landfill tax receipts. This is a transfer in savings to local councils and businesses as they forgo the costs associated with disposing of waste to landfill sites. NHM policy support costs to businesses are an additional £18m.

Other key non-monetised costs by 'main affected groups' Maximum 5 lines

Familiarisation costs to householders and businesses because of the introduction of the new practice of effectively separating their waste are not accounted for. Nor are the ongoing costs to households and businesses of sorting waste for collection. Wider impacts on the recycling and waste industry have not been monetised either.

Benefits (£m)	Total Transitional (Policy) (Constant price)	Years	Average Annual (recurring) (excl. transitional) (Constant price)	Total Benefit (Discounted to 2026) (Present Value)
Low	£0 Optional	1	-£64.21mill Optional	-£166.9 mill
High	£0 Optional		-£60.90 mill Optional	-£158 mill
Best	£0		-£63.96 mill	-£167.4 mill

Description and scale of key monetised benefits by 'main affected groups' Maximum 5 lines

Local councils see net savings (£30-33m) on ongoing costs of recycling and waste management. These represent additional net service savings, i.e., accounting for savings from increased recycling and reduced residual waste treatment costs. NHM sector's waste management savings from increased recycling are estimated at £31m. This reflects the reduced residual waste treatment costs as well as avoided landfill tax payments. Greenhouse gas (GHG) emissions savings (traded and non-traded emissions) are estimated at between £82-87m. These GHGs savings are net of emissions associated with recycling and composting activities.

Other key non-monetised benefits by 'main affected groups' Maximum 5 lines

The recycling industry benefits from increased supply of higher quality and quantity of materials. However, this has not been monetised at this stage. International GHGs emissions saving have not been included in the presented estimates but are likely to be significant. Avoiding wider environmental costs, such as landfill aftercare costs, have not been included. Reduced pressure on residual waste infrastructure and on net job impacts have not been quantified either.

Key Assumptions, Sensitivities, Risks Maximum 5 lines

For household sector, scenarios reflect the uptake in recycling based on most scheme and area relevant yields from WRAP generated WasteDataFlow (WDF) benchmark tables on achievable recycling yields.

For the NHM sector, assumptions are indicative. It is unfeasible to obtain actual performance and cost figures due to absence of reporting of what businesses have in situ and diversity of the sub-sectors in scope of NHM. Recent surveying of NI businesses was used to inform a representative baseline of service provision. The NHM analysis has been modelled to show high level assumptions on the cost burden to businesses should the recycling rate be increased. Cost burdens are related to a standard kerbside business waste collection using

BUSINESS ASSESSMENT (Option 1)

Direct Impact on business (Equivalent Annual) £m		
Costs: £17.62 m	Benefits: -£31.2m	Net: -£13.5m

Cross Border Issues (Option 1)

How does this option compare to other UK regions and to other EU Member States (particularly Republic of Ireland) Maximum 3 lines

This scenario aligns with national analyses such as the Wales blueprint kerbside recycling collections. EU Member States and especially Republic of Ireland offer waste collections services financed using different charging mechanisms and historically delivered as combined services between household and business and are therefore not directly comparable.

Summary: Analysis and Evidence

Policy Option 2

Description: All households in Northern Ireland to receive a weekly multi-stream dry recycling collection with paper/card, plastics, metals, and glass collected as a minimum. Alongside a 3-weekly or restricted capacity residual (max 180lt fortnightly), and fortnightly mixed food and garden waste collections. All businesses generating household like waste (NHM) to separate waste into mixed dry recyclables, separate glass, and separate food waste collections.

ECONOMIC ASSESSMENT (Option 2)

Costs (£m)	Total Transitional (Policy) (Constant price) Years		Average Annual (recurring) (excl. transitional) (Constant price)	Total Cost (Discounted to 2026) (Present Value)
Low	£65.76mill Optional	1	£34.85mill Optional	£129.21mill Optional
High	£75.99mill Optional		£40.55mill Optional	£154.61mill Optional
Best Estimate	£65.76m		£34.85m	£154.61m
Description and scale of key monetised costs by 'main affected groups' Maximum 5 lines Local councils see £66-76m transition costs because of investment needs in new vehicles, containers, communications, container delivery, project management on infrastructure requirements. Government loses £39m in reduced landfill tax receipts. This is a transfer in savings to local councils and businesses as they forgo the costs associated with disposing of waste to landfill sites. NHM policy support costs to businesses are £18m.				
Other key non-monetised costs by 'main affected groups' Maximum 5 lines Familiarisation costs to householders and businesses because of the introduction of the new practice of effectively separating their waste are not accounted for. Nor are the ongoing costs to households and businesses of sorting waste for collection. Wider impacts on the recycling and waste industry have not been monetised either.				
Benefits (£m)	Total Transitional (Policy) (Constant price) Years		Average Annual (recurring) (excl. transitional) (Constant price)	Total Benefit (Discounted to 2026) (Present Value)
Low	Optional	1	-£52.24mill Optional	-£151.3mill Optional
High	Optional		-£52.16mill Optional	-£151.11mill Optional
Best Estimate	£0		-£52.24m	-£151.3m
Description and scale of key monetised benefits by 'main affected groups' Maximum 5 lines Local councils see net savings (£18-21m) on ongoing costs of recycling and waste management. These represent additional net service savings, i.e., accounting for savings from increased recycling and reduced residual waste treatment costs. NHM sector's waste management savings from increased recycling are estimated at £18m. This reflects the reduced residual waste treatment costs as well as avoided landfill tax payments. Greenhouse gas (GHG) emissions savings (traded and non-traded emissions) are estimated at £84m. These GHGs savings are net of emissions associated with recycling and composting activities.				
Other key non-monetised benefits by 'main affected groups' Maximum 5 lines The recycling industry benefits from increased supply of higher quality and quantity of materials. However, this has not been monetised at this stage. International GHGs emissions saving have not been included in the presented estimates but are likely to be significant. Avoiding wider environmental costs, such as landfill aftercare costs, have not been included. Reduced pressure on residual waste infrastructure on net job impacts have not been quantified either.				
Key Assumptions, Sensitivities, Risks Maximum 5 lines For household sector, scenarios reflect the uptake in recycling based on the upper quartile yields from WRAP generated WasteDataFlow (WDF) benchmark tables on achievable recycling yields. For the NHM sector, assumptions are indicative. It is unfeasible to obtain actual performance and cost figures due to absence of reporting and diversity of the sub-sectors in scope of NHM. The NHM analysis has been modelled to show high level assumptions on the cost burden to businesses should the recycling rate be				

BUSINESS ASSESSMENT (Option 2)

Direct Impact on business (Equivalent Annual) £m		
Costs: £17.62 m	Benefits: -£31.2m	Net: -£13.5m

Cross Border Issues (Option 2)

How does this option compare to other UK regions and to other EU Member States (particularly Republic of Ireland) This scenario aligns with national analyses such as the Wales blueprint kerbside recycling collections and includes elements of England's "Simpler Recycling." EU Member States and especially Republic of Ireland offer waste collections services financed using different charging mechanisms and historically delivered as combined services between household and business and are therefore not directly comparable.

Summary: Analysis and Evidence

Policy Option 3

Description: All households in Northern Ireland to receive a weekly two stream (with paper and card separate) recycling collection with paper/card, plastics, metals, and glass collected as a minimum. Alongside a 3-weekly or restricted capacity residual (max 180lt fortnightly), weekly separate food and free garden waste collections. All businesses generating household like waste (NHM) to separate waste into mixed dry recyclables, separate glass, and separate food waste collections.

ECONOMIC ASSESSMENT (Option 3)

Costs (£m)	Total Transitional (Policy)		Average Annual (recurring) (excl. transitional) (Constant price)	Total Cost (Discounted to 2026) (Present Value)
	(Constant price)	Years		
Low	£75.31mill Optional	1	£46.36mill Optional	£144.97mill Optional
High	£79.58mill Optional		£51.18mill Optional	£182.05mill Optional
Best Estimate	£75.31m		£46.36m	£182.05m

Description and scale of key monetised costs by 'main affected groups' Maximum 5 lines

Local councils see £75-80m transition costs because of investment needs in new vehicles, containers, communications, container delivery, project management on infrastructure requirements. Government loses £43m in reduced landfill tax receipts. This is a transfer in savings to local councils and businesses as they forgo the costs associated with disposing of waste to landfill sites. NHM policy support costs to businesses are £18m.

Other key non-monetised costs by 'main affected groups' Maximum 5 lines

Familiarisation costs to householders and businesses because of the introduction of the new practice of effectively separating their waste are not accounted for. Nor are the ongoing costs to households and businesses of sorting waste for collection. Wider impacts on the recycling and waste industry have not been monetised either.

Benefits (£m)	Total Transitional (Policy)		Average Annual (recurring) (excl. transitional) (Constant price)	Total Benefit (Discounted to 2026) (Present Value)
	(Constant price)	Years		
Low	Optional		-£49.06mill Optional	-£144.24mill Optional
High	Optional		-£48.74mill Optional	-£143.59mill Optional
Best Estimate	£0		-£49.06m	-£144.24m

Description and scale of key monetised benefits by 'main affected groups' Maximum 5 lines

Local councils see net savings (£18m) on ongoing costs of recycling and waste management. These represent additional net service savings, i.e., accounting for savings from increased recycling and reduced residual waste treatment costs. NHM sector's waste management savings from increased recycling are estimated at £18m. This reflects the reduced residual waste treatment costs as well as avoided landfill tax payments. Greenhouse gas (GHG) emissions savings (traded and non-traded emissions) are estimated at £81m. These GHGs savings are net of emissions associated with recycling and composting activities.

Other key non-monetised benefits by 'main affected groups' Maximum 5 lines

The recycling industry benefits from increased supply of higher quality and quantity of materials. However, this has not been monetised at this stage. International GHGs emissions saving have not been included in the presented estimates but are likely to be significant. Avoiding wider environmental costs, such as landfill aftercare costs, have not been included. Reduced pressure on residual waste infrastructure on net job impacts have not been quantified either.

Key Assumptions, Sensitivities, Risks Maximum 5 lines

For household sector, scenarios reflect the uptake in recycling based on the upper quartile yields from WRAP generated WasteDataFlow (WDF) benchmark tables on achievable recycling yields.

For the NHM sector, assumptions are indicative. It is unfeasible to obtain actual performance and cost figures due to absence of reporting and diversity of the sub-sectors in scope of NHM. The NHM analysis has been modelled to show high level assumptions on the cost burden to businesses should the recycling rate be

BUSINESS ASSESSMENT (Option 3)

Direct Impact on business (Equivalent Annual) £m		
Costs: £17.62 m	Benefits: -£31.2m	Net: -£13.5m

Cross Border Issues (Option 3)

How does this option compare to other UK regions and to other EU Member States (particularly Republic of Ireland)

This scenario aligns with national analyses such as England's "Simpler Recycling" and Local Authority service delivery in Scotland. EU Member States and especially Republic of Ireland offer waste collections services financed using different charging mechanisms and historically delivered as combined services between household and business and are therefore not directly comparable.

Evidence Base

There is discretion for departments and organisations as to how to set out the evidence base. It is however desirable that the following points are covered:

- Problem under consideration.
- Rationale for intervention.
- Policy objective.
- Description of options considered (including do nothing), with reference to the evidence base to support the option selection.
- Monetised and non-monetised costs and benefits of each option (including administrative burden).
- Rationale and evidence that justify the level of analysis used in the RIA (proportionality approach).
- Risks and assumptions.
- Direct costs and benefits to business.
- Wider impacts (in the context of other Impact Assessments in Policy Toolkit Workbook 4, economic assessment and NIGEAE)

Inserting text for this section:

Text can be pasted from other documents as appropriate.

Problem under consideration

Northern Ireland is committed to achieving Net Zero by 2050 and at least 70% of waste to be recycled by 2030 through the introduction of The Climate Change Act (Northern Ireland) 2022. The EU Circular Economy Package (CEP) also commits Northern Ireland to the following targets:

- 65% of municipal waste prepared for re-use and recycled by 2035 (with interim targets of 55% by 2025 and 60% by 2030); and
- The amount of municipal waste sent to landfill to be reduced to 10% or less of the total amount of municipal waste generated (by weight) by 2035.

Resource and waste management has a key role to play in helping to tackle climate change and the transition to a low carbon, Circular Economy. When waste is sent to incineration or landfill, it emits greenhouse gases. Recycling reduces the environmental costs of products/materials being disposed of where waste cannot be prevented. It also generates value by providing raw materials for manufacturing. There is a need to improve the quality and quantity of household and non-household municipal recycling, reduce food waste, decrease the amount we landfill and help enhance the services offered to households and businesses.

Household waste

Published results suggest that the recycling rate has dropped during 2021/22, indicating that the increase in recycling rates seen between 2001/02 and 2021/22 will not be maintained and that recycling rates may stagnate, or even begin to decrease, without new drivers and support. With council recycling rates hovering around 50% for the past 5 years and business recycling rates estimated by WRAP to be 40.6%, reaching the 70% recycling target will not be possible without new forms of cross sector intervention.

For some time, the main driver for Councils to divert waste from landfill towards energy recovery and recycling has been landfill tax. This has been the impetus for the roll out of recycling services collecting most dry recyclable materials. There appears to be a natural ceiling for recycling rates with current Council budgets, and the need for proportionately more expensive services to deliver higher performance levels. Efficiencies in collection can help reduce costs. Experience from across the UK shows that national Government endorsement of services, such as residual restriction, provided alongside comprehensive recycling schemes, is likely to lead to higher performing and lower cost collections. There can be limited benefits of expanding recycling services to include certain types of plastics where the secondary markets value of those materials is less than the costs of collection, without a change in policy to incentivise collection.

Non-household Municipal (NHM) waste

Revisions introduced to the Waste Framework Directive by the Circular Economy Package bring business waste, which is like household waste, into the encompassing definition of municipal waste, alongside household waste. Given the size of the business sector (around 58,000 business and public administration units), it has the potential to make a significant contribution to the overall municipal recycling rate. Historically, the various sub-sectors in business have not had direct policy measures to

drive their recycling performance apart from the price they pay for the collection of waste versus recycling. Business waste and recycling services tend to be a very small proportion of overall business turnover and so efficiency gains in diverting more waste to recycling may yield comparatively few savings at site level and provide limited financial incentive to separate waste. Generally, waste collection services are offered on a per bin or per lift basis, therefore, businesses would pay a higher cost for having additional bins (unless reducing the number of refuse bins). There may be only a small saving per business to arrange for separate collection of dry recyclables and food waste.

Currently, there is a substantial variation in the sector's performance, both across sub-sectors and business sizes, and data quality is poor compared to the household sector. There is great potential to increase municipal recycling rates through introducing requirements for greater separation, especially of dry materials and food waste.

WRAP estimates there is potential to increase recycling up to as much as 84% under full capture of remaining recyclates. This is a theoretical potential that could be only achieved by implementing substantial changes to the way the NHM waste sector operates and depends on the levels of participation, material capture and waste composition of waste that businesses generate. These changes could, for example, include measures to ensure more municipal businesses have access to recycling collection services at reasonable cost. This could be achieved through businesses investing in jointly procured services or by Councils and other bodies (such as facilities managers) controlling waste procurement over a group of premises in a single building or shopping centre etc. to realise economies of scale and to increase recycling provision.

Rational for Intervention

Household sector

Currently, Councils provide collections of waste and recycling based on their own decisions. This flexibility helps to account for local circumstances. However, evidence shows that this can create confusion to householders over the type of materials collected and the way they should be presented for the collection. Requiring a certain set of materials to be collected consistently across Northern Ireland would improve householders' understanding and participation in the collection systems. In Northern Ireland, 98% of households already have a food waste collection³. A WRAP study comparing the capture rate for food waste from separate collections to mixed food and garden waste collections, suggest that the gains from these services could be increased if food waste were collected separately from garden waste on a weekly basis⁴. There is also a potential to co-collect food waste on vehicles, alongside multi-stream dry recycling, reducing both capital and ongoing costs. Combining a better understanding of what materials can be recycled with a restriction in residual waste capacity (through the frequency of collection or capacity of the container) could generate a significant increase in recycling rate, up to 62% (based on Table 2, Option 2).

The RIA suggests that certain collection options (options 1 and 2) could result in cost savings for Councils over time (the assumed 7-year life span of a vehicle). However, with high transition and capital costs, it could be perceived as a cost burden in the short term. Savings can depend on receiving an unknown income from selling separately collected materials as well as unknown charges via gate fees' payments, compared with what the Councils currently pay. A combination of significant upfront costs and uncertain long-term savings, or localised political preferences, can make change more difficult for Councils and can be the reason for change not being implemented independently.

Non-household municipal sector

The main behavioural and cost barriers to businesses and public sector organisations generating household-like waste (i.e., non-household municipal sector (NHM)), are particularly relevant to small and micro businesses. Research has shown the following barriers to be significant for these businesses.

- Lack of clarity on their responsibilities
- Waste and recycling are low on their business agenda.
- Lack of knowledge and skills in waste management
- Lack of space to store bins
- High turnover of staff

³ [WRAP LA Portal](#)

⁴ [Performance analysis of mixed food and garden waste collection schemes | WRAP](#)

Businesses typically pay for the collection and subsequent processing of material in their waste and recycling collection containers on a regular schedule, under contract. The charges per bin lift are lower for recycling collections than for residual bins due to the value of the material and/or their lower processing costs. However, a refuse container may still be required even with the diversion of some recyclable waste from the refuse bin. Unless the residual waste collection can be reduced in frequency or suspended, the need for a range of recyclable containers to collect the extra material streams will increase cost to businesses. For larger businesses, reducing the number of refuse containers and using those savings to pay for more recycling is likely to generate overall savings. The difficulties for small businesses when re-configuring the container mix is the limited number of containers with which they may start. Adding separate streams could increase overall costs at current market prices.

The recycling potential from NHM sectors is significantly greater than from household waste, which contains greater proportions of non-recyclable waste due to the presence of materials such as absorbent hygiene products and pet wastes etc. Waste composition profiles from various NHM sectors all show large proportions of recyclable waste. This is primarily due to businesses purchasing packaged (generally cardboard) goods from their supply chain, food waste generated in preparation and post-consumer waste (such as glass bottles in the hospitality trade).

The introduction of regulation could drive high participation in recycling services, requiring businesses to separate key materials and save businesses money overall through improving the economies of scale in collection. Businesses would be required to segregate their core waste into up to four streams depending on the types of waste the businesses generate. There are limited options to incentivise businesses to separate key materials without the intervention of legislation, which is vital in meeting NI's national targets.

It is important to note that whilst the waste management savings seem large for businesses overall, when considered at the individual site level, considering circa 58,000 businesses, savings are relatively small when waste costs remain a very small proportion of their overall turnover. The importance of legislation is to force the business case to happen by optimising containment, which would be unlikely to happen without large scale participation across the numerous and diverse NHM sectors. Savings for businesses also relies on the higher revenue for higher quality separated materials being passed onto the waste generating businesses. This may not be the case if a business were to adopt the preferred collection regime in isolation from other businesses. This is due to the overhead costs involved in a collection vehicle servicing each business' site. There is a potential that a lack of co-ordination across NI may prevent the realisation of both environmental and economic benefits.

The charges for container collections in this analysis use current market prices which reflect current low levels of participation and separation. Greater presentation of recyclable materials, through legislative intervention, could reduce charges to businesses. This reduction would be through improved efficiency of collection, making better use of collection assets and increased revenue from the capture of more recyclable materials. However, due to the complexity in charging and the range of NHM business in the analysis, a future reduction in container charges has not been assumed in this assessment.

The feedback to DAERA's 2020 Discussion Document outlined that there are numerous current and future practical options that could reduce current charges for businesses⁵. These constructive options include proliferation of Business Improvement Districts to realise economies of scale and greater collaborative procurement at site level or area level; use of local household bring sites for commercial waste drop off; expansion of dedicated commercial waste bring centres and several examples of joint procurement driven by Councils.

Environmental externalities

The environmental impacts of resources used, and waste generated by the municipal sector are not fully accounted for when considering waste disposal options. Despite incentives being aligned to the waste hierarchy, there is still a significant amount of waste that ends up in landfill and incineration, the least environmentally friendly option. In fact, the total amount of residual waste (sent to landfill or incineration)

⁵ Summary of Responses - Future Recycling and Separate Collection of Waste of a Household Nature in Northern Ireland

generated by councils has remained stable over recent years⁶. In relation to local authority collected municipal waste managed in Northern Ireland during the 2021/22 financial year, the energy recovery rate decreased by 1.3% while the landfill rate increased by 2.1%⁷. These environmental impacts range from the impact on natural resource depletion, greenhouse gas emissions, and wider ecosystem impacts associated with the extraction of raw materials, compared to the use of secondary, recycled materials. Recycling activities are less carbon intensive compared to the refuse waste treatment options and help reduce reliance on virgin materials.

Description of Options

DAERA supports comprehensive and regular waste collections that help conserve our resources, in accordance with the Waste Hierarchy, prioritising waste prevention followed by reuse and recycling. Our Waste Prevention Programme 2020 and our upcoming Waste Management Strategy have and will set out how we must improve waste prevention and reuse. Where prevention or reuse are not an option we must encourage as much recycling, and in particular closed-loop recycling, as possible. This Impact Assessment focuses on the recycling stage of the waste hierarchy and, following its conclusion, the Department will seek to implement new policy and legislation to:

- Future-proof our collection services.
- Meet our challenging targets.
- Facilitate tackling climate change; and
- Support the transition to a Circular Economy.

The options considered in this analysis are informed by previous WRAP and DAERA studies on maximising national recycling performance⁸. The scenarios modelled, include well established scheme design principles and peer reviewed industry assumptions. Good practice scenarios have been examined for both household and NHM sectors and this study focuses on the combined impacts. WRAP's Kerbside Analysis Tool (KAT) was used to model the cost and performance associated with a range of scenarios. The tool applies a set of assumptions, to local council specific data, to generate indicative collection and capital costs. The cost and performance data were ranked for each scenario based on lowest cost and greatest increase in recycling rate. The top 7 scenarios are listed below, in rank order.

- **Scenario 6** - 3-wkly residual, multi-stream (boxes), separate food, separate garden (free)
- **Scenario 1** - Restricted residual 180lt, multi-stream (boxes), separate food, separate garden (free) (seasonal set out accounted for)
- **Scenario 7** - 3-wkly residual, multi-stream, separate food, separate garden (free)
- **Scenario 16** - 3-wkly residual, multi-stream (boxes), mixed food & garden
- **Scenario 9** - 3-wkly residual, twin-stream fibres, separate food, separate garden (free)
- **Scenario 11** - Restricted residual 180lt, multi-stream (boxes), mixed food & garden
- **Scenario 4** - Restricted residual 180lt, twin-stream fibres, separate food, separate garden (free)

Scenarios 6, 1 and 7 were ranked as the top 3. As they were so similar in configuration, it was decided they be grouped as Option 1. Scenario 16 became Option 2 and Scenario 9, Option 3.

From a comprehensive array of 21 potential collection configuration scenarios, the top three (in terms of highest recycling rate and lowest net cost across NI) are presented in Table 1 below.

⁶ [Northern Ireland local authority collected municipal waste management statistics time series data | Department of Agriculture, Environment and Rural Affairs \(daera-ni.gov.uk\)](#)

⁷ [LAC-Municipal Waste 2021-22-reportv2.pdf \(daera-ni.gov.uk\)](#)

⁸ [Municipal Recycling Potential in NI 2020 \(WRAP Report\).PDF \(daera-ni.gov.uk\)](#)

Table 1: Description of options considered for household and non-household municipal waste sectors

	Option 1	Option 2	Option 3
Household Sector (HH)	All households in Northern Ireland to receive a weekly multi-stream dry recycling collection with paper/card, plastics, metals, and glass collected as a minimum. Alongside a 3-weekly or restricted capacity residual (max 180L fortnightly), weekly separate food and free garden waste collections.	All households in Northern Ireland to receive a weekly multi-stream dry recycling collection with paper/card, plastics, metals, and glass collected as a minimum. Alongside a 3-weekly or restricted capacity residual (max 180L fortnightly), and fortnightly mixed food and garden waste collections.	All households in Northern Ireland to receive a weekly two stream (with paper and card separate) recycling collection with paper/card, plastics, metals, and glass collected as a minimum. Alongside a 33-weekly or restricted capacity residual (max 180L fortnightly), weekly separate food, and free garden waste collections.
Non-Household Municipal (NHM) sector	All micro, small, medium, and large businesses generating household like waste (non-household municipal) to separate waste into mixed dry recyclables, separate glass, and separate food waste collections.		

Waste collection system definitions

Dry recycling/recyclables: Paper, cardboard packaging, plastic packaging, glass packaging, metal packaging etc.

Multi-stream collection: Dry recycling materials are presented for collection by the household in three separate containers and remain separate once collected.

Two-stream collection: Dry recycling materials are presented for collection in two separate containers, where one material (usually paper/cardboard or glass) remains separate, and the remaining dry recyclables are combined in the same container.

Dry mixed recyclables (DMR) collection: Dry recycling materials are presented together in one bin. This also called commingling.

Separate food waste collections: Food waste is collected in a separate container from other organic waste and remains separate once collected.

Separate free garden waste collections: garden waste is collected separately from other waste materials at households and is not charged for.

Low-rise properties: For households, properties that are usually three stories or less whose waste is collected at kerbside.

Communal properties: Where waste and recycling are placed in shared bins by residents. The containers may be collected on kerbside rounds. The distinction between low-rise and communal properties is made as collections from shared bins often have different timing factors (there may be multiple large bins to empty, but the distance from the highway to the bin could be significant) and participation from residents is often lower. This can be attributed to the complexity of the systems, inadequate space, and the anonymity of communal bins⁹. The number of properties assumed to receive a communal waste and recycling collection is taken from Land & Property Services (LPS) data unless the Council supplied better data individually¹⁰.

Policy objective

We want all Councils in Northern Ireland to collect a core set of dry materials. These include glass, paper, cardboard, metal packaging, plastic bottles and plastic pots, tubs, and trays. In Northern Ireland, 69% of households currently have a collection of all these materials¹¹. The expansion of a collection of comprehensive materials to all councils would increase the quantity of dry recyclable material collected. This, combined with clearer labelling of recyclable packaging, would also reduce confusion among households over what can and cannot be recycled. This would help to reduce contamination of non-recyclable items in recycled materials, providing higher quality recyclates for reprocessors and secondary

⁹ Report - Making recycling work for people in flats 2.0 - ReLondon

¹⁰ <https://www.finance-ni.gov.uk/land-property-services-lps>

¹¹ WRAP LA Portal

materials markets. Nationally collected data from MRFs shows much higher levels of contamination for mixed material streams, compared to part-mixed or separate streams¹².

We also want all households to receive a separate food waste collection, which can then be sent to anaerobic digestion sites where it generates biofuel and a nutrient-rich fertiliser, rather than landfill, where it releases methane and contributes to the generation of leachates which impact groundwater quality. The UK is committed to working towards sending no food waste to landfill by 2030 through its 2017 Clean Growth Strategy¹³.

We want all businesses and public sector organisations generating household-like waste to segregate this into a core set of dry recyclable materials and food waste. Greater consistency in the range of materials presented will enable increased economies of scale in service provision (e.g., reducing the costs of food waste collections) and reduced charges to businesses. The increased quantity and quality of materials will ensure more viable and resilient secondary markets. These measures would impose some additional costs on businesses but there is potential to reduce these costs through shared collection services across businesses or districts, reducing collection overheads for individual businesses.

Costs and Benefits

The impacts of combining the household and non-household recycling scenarios, as laid out in table 1 ('Description of options considered') can be seen in the following summary (Table 2). The scenarios assume that these collection systems would be introduced through a variety of different regulatory requirements.

Recycling rate: a combination of ambitious household and NHM scenarios show the potential to increase in the municipal recycling rate in the range of 72% to 74% by 2026.

Local Council waste management costs: All scenarios considered evidence a net cost saving across Northern Ireland. For all scenarios there is an increase in costs during the initial implementation, but these are offset by the savings in avoided landfill, reduced gate fees and increased revenue.

NHM waste management costs: The largest savings are observed for large, medium, and small businesses. Micro businesses typically experience a net cost increase in waste management. These substantial savings can be attributed to optimised use of recycling and waste services, i.e., the reduced use of more expensive residual waste collections in exchange for cheaper recycling collections. For small and micro businesses, savings can be achieved through a shared service provision of recycling and waste collections. In the analysis we assume that some micro and small businesses would make use of the provision, though many currently do not.

Landfill tax impact: All municipal scenarios are estimated to see a substantial reduction in landfill tax. The modelling results show that up to 58.4% of municipal solid waste (MSW) currently sent to landfill or Energy from Waste (EFW) in NI, could be diverted to recycling.

GHG emissions savings: All municipal scenarios achieve a substantial reduction in GHGs emissions with associated societal savings. These range between £81m and £86m per year across the three scenarios.

Present value: *Option 1* sees societal savings due to the net cost savings from introducing multi-stream collections which can co-collect food waste as well as waste management savings across the NHM sector. GHG emissions savings are greatest for this option.

Option 2 sees similar societal savings however GHG emissions savings are lower for this option due to the mixing of food and garden waste.

Option 3 sees the lowest societal savings. This is due to local councils not saving on the co-collection of food waste. GHG emissions savings are lowest for this option due to the remaining comingled element.

Non-monetised costs and benefits: There are several potential additional costs and benefits across the municipal sector as part of each scenario however they are extremely difficult to quantify and hence have not been included in the costings against each option. These include the impacts on recycling and waste infrastructure needs, familiarisation costs, wider economic benefits, landfill aftercare costs, international GHGs emissions savings and household and business inconvenience and disamenity costs.

¹² [WasteDataFlow Waste Management](#)

¹³ [2017 Clean Growth Strategy](#).

Table 2 below summarises the net costs and savings of each scenario. All results are shown with constant prices and, where relevant, applying an annual discount rate of 3.5% per year¹⁴. The analysis follows the Aqua book principles throughout¹⁵.

Table 2: Summary of impacts of considered policy options. (discounted, against baseline) Costs (+) savings (-)	Option 1 HH: Restricted or 3 weekly residual, multi-stream recycling and separate food NHM: DMR + separate food waste + separate glass	Option 2 HH: Restricted or 3 weekly residual, multi-stream recycling and mixed food and garden waste NHM: DMR + separate food waste + separate glass	Option 3 HH: Restricted or 3 weekly residual, two-stream recycling and separate food NHM: DMR + separate food waste + separate glass
Municipal recycling rate achieved. (modelled baseline)	74% ** (62% HH, 84% NHM)	72% ** (57% HH, 84% NHM)	74% ** (62% HH, 84% NHM)
Additional Local Councils net waste management costs (+)/savings (-) from changes in dry recycling and food waste collections for all HHs	£60-80m: £76-101m capital and transition costs, -£16-21m savings on ongoing costs (per annum) *	£54-59m: £66-76m capital and transition costs, -£12-17m savings on ongoing costs (per annum) *	£73-77m: £75-80m capital and transition costs, -£2-3m savings on ongoing costs (per annum) *
Net waste management costs (+)/savings (-) to NHM businesses under increased recycling collections	-£13.5m	-£13.5m	-£13.5m
Monetised benefit of avoided carbon emissions ¹⁶	£82-87m	£84m	£81m
Reduction in government landfill tax receipts (benefits to municipal	£40-42m	£39m	£43m

* Cumulative savings would be seen over the life span of a vehicle (assumed 7 years) in options 1 and 2 that could offset the capital and transition costs

** Contamination removed

Key Assumptions and Data Used

Household Modelling and Assumptions

The following section describes the key assumptions driving the performance, costs, and savings in household recycling scenarios. It is not within the scope of the IA to provide a full model description here. Please refer to WRAP ICP2 – Online Tool Modelling Assumptions Technical Annex¹⁷ for full assessment of the methodology.

The household sector analysis is undertaken from a bottom-up approach which considers the known baseline profiles of each collection authority in England. The data used to build the individual baselines is derived from WRAP's local authority collection scheme data on the LA Portal¹³ which is updated and checked annually, combined with performance data benchmarks, processed from Waste Data Flow¹⁸. The overall net service costs of waste and recycling can be split to a number of key elements including the collection costs, material revenue from recyclates (e.g. under separate collection of dry material streams), required sorting costs (e.g. gate fees paid by Councils to process comingled dry recycling through a material recycling facility operations) and treatment and disposal costs (from food waste to garden waste or refuse waste). However, when scaling and comparing costs across Councils, the

¹⁴ HM Treasury, 2018, The Green Book: central government guidance on appraisal and evaluation.

¹⁵ HM Treasury, 2015, The Aqua Book: guidance on producing quality analysis for government.

¹⁶ HM Treasury, 2021, Valuation of greenhouse gas emissions: for policy appraisal and evaluation – GOV.UK (www.gov.uk)

¹⁷ WRAP LA Portal

¹⁸ WasteDataFlow Waste Management

comparison is difficult due to different local circumstances, different services included in the costs, no formal reporting method and so on. Thus, WRAP developed the Kerbside Analysis Tool (KAT) to establish standardised costs to enable fairer comparison between collection systems. KAT uses actual scheme collection timings collected from over 100 hours of filming a wide range of collection services. The tool assumes the waste flows are linked in a way that collection savings in refuse collection and disposal costs are possible in high recycling scenarios. KAT is typically used for individual local Council support projects to produce a bespoke and transparent kerbside analysis to account for aspects such as service profile, operational efficiency, and recycling performance, set out and capture rates, geography and how service profiles interact. Given the number of Councils in Northern Ireland, and the support from authorities sharing their data, it was possible to model bespoke baselines and scenarios for each Council and scale up the results to indicate the costs and benefits at a national level. The spreadsheets produced in this analysis have been subjected to peer review. The outputs from the model runs were subject to analytical review (i.e., sense checking) by WRAP Analysts and Resource Management Specialists and compared to UK benchmarks.

Contamination rates for commingled material collections were council specific, however the NI average was 16%. In the scenario modelling, twin stream collections were assumed to have a 10% contamination rate, three-stream collections to have a 4% rate and multistream to have a 0.1% contamination rate, based on data provided by the councils. Feedback from reprocessors has suggested there is further process loss in the material stream.

Price Assumptions

All modelling is based on current prices. The material value is known to fluctuate and will affect material incomes that are accounted for in sorting costs (i.e., these are net of income received for sold material) as well as direct payment in scenarios where materials are collected separately (i.e. for fibres in twin-stream scenarios and separately collected materials in multi-stream scenarios). The material income is based on the average prices from the last five years as reported in the Materials Pricing Report <https://wrap.org.uk/resources/report/materials-pricing-report>¹⁹.

Council specific data for treatment and disposal costs were used where possible. Where not available, costs are taken from the WRAP gate fee survey (2021/22)²⁰ across various waste and recycling facilities, using average values for key recycling and waste treatment facilities, including materials recycling facilities (MRFs), energy from waste plants and landfill. In addition, bulking and haulage costs are added relative to the scheme profile where required. Haulage costs are also considered in the materials pricing where appropriate. Vehicle and container prices were updated during 2022/23 via consultation with manufacturers to reflect current levels of inflation.

WRAP and DAERA engaged with Councils throughout 2022 and 2023 on transition costs, to understand the costs of change from a baseline to a new set of scenarios. The scope of transition costs was reported to include procurement, round design, communications, container delivery, project management, depot, and transfer station modifications. The costs were provided by each Council and applied to the changes in collection system option detailed above.

GHG Emission Savings

The greenhouse gas emissions analysis of recycling scenarios has been calculated using carbon emissions values from WRAP's Carbon Warm from 2021 for the following activities:

- Recycling and composting
- Energy recovery
- Landfill

GHGs emissions changes are split in terms of whether they occur in sectors covered under the EU Emissions Trading Scheme²¹ (ETS) ('traded emissions') or outside the EU ETS ('non-traded emissions'). In the case of waste, emissions from waste sent to landfill and incineration are non-traded, and emissions from recycling and composting are traded.

¹⁹ [Materials Pricing Report | WRAP](#)

²⁰ [Gate Fees 2021/22 report | WRAP](#)

²¹ https://ec.europa.eu/clima/policies/ets_en

The calculations are based on the unnormalised greenhouse gas conversion factors from WRAP's Carbon Warm Metric shown in Table 3²². The GHG savings were monetised using an assumption for each of the options' GHG emissions savings and applied the carbon price of £252 p.t.CO2 eq. which relates to 2023, central series²³.

WRAP's Carbon WARM was used to quantify the emissions impact of the different waste management routes and is measured in kilograms of carbon dioxide equivalent. This method was chosen as it quantifies the impact of how waste is treated and/or disposed of. The alternative BEIS conversions factors are solely for reporting scope 3 emissions and so do not offer a complete picture of the entire impact of the different waste treatment methods.

Table 3: WRAP's Carbon Warm Metric

	Closed loop recycling	Open Loop recycling	Energy from Waste	Anaerobic digestion	Compost used in horticulture	Compost used in agriculture	Landfill	Disposal (Landfill + EFW)
Food	NA	NA	-37	-78	-44	16	627	308.28
Garden	NA	NA	-77	-78	-15	86	579	264.12
Food and garden	NA	NA	-70	-78	-24	67	592	274.24
Paper and board	-104	NA	-218	NA	NA	NA	1042	437.2
Steel	-1062	NA	19	NA	NA	NA	9	13.8
Aluminium	-7469	NA	24	NA	NA	NA	9	16.2
Mixed (cans)	-3368	NA	21	NA	NA	NA	9	14.76
Glass	-326	33	8	NA	NA	NA	9	8.52
Textiles	-14315	NA	438	NA	NA	NA	445	441.64
Dense plastics	-590	205	1691	NA	NA	NA	9	816.36
Film	-532	205	1475	NA	NA	NA	9	712.68
Wood	-477	NA	-268	NA	NA	NA	828	301.92

*Disposal (Landfill + EFW) was calculated by applying the 48%/52% disposal ratio found in the Local Authority Collected Waste Statistics²⁴

²² <https://wrap.org.uk/resources/report/carbon-waste-and-resources-metric>

²³ Valuation of greenhouse gas emissions: for policy appraisal and evaluation - GOV.UK (www.gov.uk)

²⁴ [lac-municipal-waste-2021-22-data-tables - RT3T10T16T21T18.xlsx \(live.com\)](#)