

SYNOPSIS OF THE REPORT PRODUCED BY FRITH RESOURCE MANAGEMENT

This is a synopsis of the “Residual Waste Post-2028’ review undertaken by Frith Resource Management (FRM) - final report dated April 2024. The full report has been reviewed through the Future Residual Waste Board with input from the appropriate Council officers across corporate teams (finance, legal, procurement). This synopsis intends to summarise the work undertaken while removing any commercially sensitive detail.

Introduction

The Council engaged FRM with the purpose of identifying the most cost-effective and resilient long-term strategy to manage residual waste from 2031 onwards. The Council currently has a number of contracts with different suppliers for residual municipal waste treatment and disposal, to enable it to meet its statutory duties under the Environmental Protection Act. These contracts have varying end dates, but feature break clauses across the period of 2028-2031. The FRM report assumes that break clauses will be implemented at the appropriate time, such that waste management options can be fairly compared for a 20-year period from 2031 onwards. This range of options consider the most likely impact of legislation and market influences while also incorporating sensitivities around these to enable the Council to understand the impact of the critical variables around waste management cost.

The review and subsequent report incorporate the following elements across five deliverables: consideration of legislation and policy that may affect arisings and / or waste management decisions; projection of potential scale of arisings of residual waste; market research on available waste treatment options, and appraisal of options, taking into account cost, carbon, deliverability and resilience.



Figure 1: The deliverables of the consultancy work

Legislation and Policy

A full review of existing and possible future legislation and policy that may affect arisings and/or waste management decisions was carried out. This included:

- a) Fiscal drivers, including taxes such as the Emissions Trading Scheme (ETS), which will have cost implications for Energy from Waste (EfW) facilities.
- b) Material specific measures, such as reduction/waste minimisation initiatives including the waste, packaging and collection reforms and legal requirements to remove charging for DIY waste at Recycling and Household Waste Sites (RHWS), increase in batteries and Waste Electrical & Electronic Equipment (WEEE) recycling, and regulations around segregation of waste containing Persistent Organic Pollutants (POPs).
- c) Collectively these changes will fundamentally alter the residual waste market as a whole and may impact local waste management facilities depending on their ability/suitability to upgrade as appropriate.

Projection of Residual Waste Arisings

The Council currently treats and disposes of circa 170,000 tonnes per annum of residual municipal waste (comprised of black bag waste collected from the kerbside; residual 'bulky' waste deposited at RHWS; and through bulky waste collection schemes, residual trade waste and street litter). Current arisings, considering growth in households as well as legislative and policy impacts were used.

The waste projections showed that the Council may need to manage between 100ktpa and 180ktpa of in scope residual waste dependent on the level of policy interventions and behavioural change. The core waste growth projection of circa 105,000 tonnes per annum (option B of Figure 2) of total residual waste by 2050/51 was selected as the projected volume, considering the likelihood of the possible legislation and model and population growth.

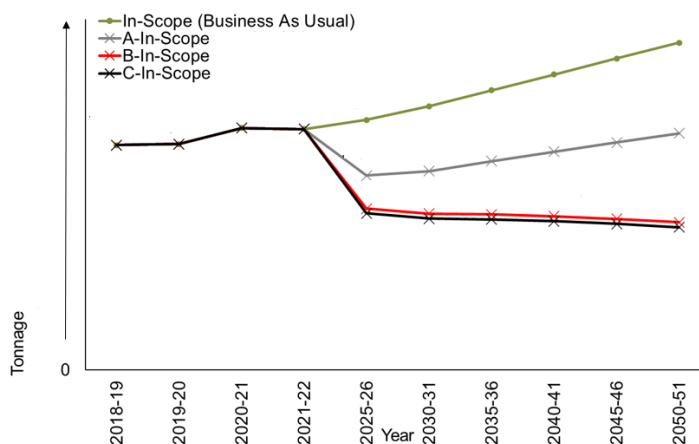


Figure 2: The impact of the varying level of policy intervention on waste arisings.

Market Research on Available Waste Treatment Options

Considering the waste projections, a technology neutral approach was adopted in the market research, which considered EfW, Mechanical Biological Treatment, Mechanical Treatment with the production of Refuse Derived Fuel and Advanced Thermal Treatment (e.g. gasification). Emerging technologies were researched and were considered too immature to provide a viable alternative to EfW unless significant research and development funding was made available. Such funding was not identified at the time of the report.

In addition to the technology research, further research was undertaken on the local market for waste management which considered treatment facilities, partnerships, supply chain, and the suitable location of any new treatment facility. These factors were used as part of the appraisal which aimed to identify the single best approach for the Council to adopt.

Options Appraisal

The market research identified building an EfW facility as the only realistic capital investment route for waste management. Considering this against merchanting, with or without partnership working and then also pre-treatment options, this resulted in 54 combinations (initial long list). FRM worked with the Council through workshopping to reduce this to a most realistic shortlist of nine options to enable the appraisal to be undertaken to the required breadth and depth.

These nine options are provided in the Figure 3 below which included consideration for bulky waste and mixed residual through combinations of continuing merchanting/re-merchanting, building large scale capital facility/infrastructure and,

where applicable, considering joint arrangements with other local authorities (partnership working).

Each option was assessed against the following criteria:

1. Cost (total over a 20-year period) based on a project specific FRM developed cost model.
2. Strategic level carbon modelling (produced using the Waste Resources Assessment Toolkit for the Environment – which is a lifecycle assessment software which was developed in partnership with the Environment Agency to enable local authorities to model the potential life cycle carbon impacts of current and future waste services).
3. Deliverability – compared qualitatively considering the challenges of implementing each option.
4. Resilience (operational and cost) – compared qualitatively by considering the risk arising from different foreseeable market and legislation scenarios.

The bespoke cost model was developed to enable cost comparison of the shortlisted options. This model was informed by a combination of information obtained through the supply chain and from FRM's industry knowledge. As part of the cost appraisal, a number of sensitivities were tested which highlighted in particular the uncertainties around the impact of ETS legislation and energy prices which have varied significantly in recent years.

Option ref	Treatment of main mixed residual waste		Treatment of bulky waste / requiring shredding	
A	1	Merchant Facility (single lot)	a	Use merchant capacity for pre-treatment / shredding bulky waste
B	1	Merchant Facility (single lot)	b	Develop own pre-treatment / shredding facility in Leicestershire
C	3	Partner with [LA partner/s] for Merchant Facility (single lot)	a	Use merchant capacity for pre-treatment / shredding bulky waste
D	3	Partner with [LA partner/s] for Merchant Facility (single lot)	b	Develop own pre-treatment / shredding facility in Leicestershire
E	5	Partner with [LA partner/s] to develop dedicated EfW facility	b	Develop own pre-treatment / shredding facility in Leicestershire
F	10	Continue current arrangements	a	Use merchant capacity for pre-treatment / shredding bulky waste

Option ref	Treatment of main mixed residual waste		Treatment of bulky waste / requiring shredding	
G	10	Continue current arrangements	b	Develop own pre-treatment / shredding facility in Leicestershire
H	11	Develop own Treatment EfW facility (LCC waste only)	b	Develop own pre-treatment / shredding facility in Leicestershire
I	15	Develop own Treatment EfW facility (LCC waste + 3rd party waste)	b	Develop own pre-treatment / shredding facility in Leicestershire

Figure 3: Nine options for detailed appraisal

Results

The initial results, considering the cost model only, outputted Option C to ‘partner with local authorities to merchant the treatment of residual waste’, as the best value option. However, this was only marginally lower cost than partnering with local authorities to develop a purpose built EfW facility (Option E) on Net Present Value estimates. On further scrutiny of the results, it was apparent that many of the options resulted in similar figures, with two of the options estimated less than 5% higher than the lowest cost estimated, and all but one of the options being within 15%. This resulted in low confidence in selecting an option based on the cost model alone.

Further uncertainty to the above cost proximity, was due to the impact of the sensitivities, of which ETS impact and energy price assumptions had the greatest influence; even relatively small changes in these figures from the estimate resulted in a different ranking of options. Considering the uncertainty around ETS and the recently volatile energy costs, the estimated values were relatively low confidence and as such, the resultant figures were deemed too low reliability to rank the options against each other without considering other factors.

Aside from the sensitivities, the risk profile was considered for each individual option across both deliverability and resilience. Where both pre-treatment and EfW use merchanting, the risks were considered very low. Amber risks were identified for options either requiring building of a pre-treatment facility but merchanting for disposal of residual waste or where partnership working is required for merchanting.

All options which incorporated the building of an EfW facility generated high risks around deliverability and amber risks around cost resilience. In regard to the build options, notwithstanding the high risks identified through the sensitivities which ultimately are considered the largest risks; there are also considerable risks noted around initial deliverability (substantial capital investment requirement, high degree

of planning risk and risks around whether a case for further capacity i.e. a 'need' within the locality, access and transport impacts), cost resilience (direct exposure to liabilities around the lifecycle and also in regard to future regulatory changes, with limited flexibility to react e.g. Carbon Capture and Storage not considered a viable possibility at this scale/location, direct exposure to changes in law).

	Merchant EFW Facility	Merchant EFW Facility	Partner with [LA partners] for Merchant EFW Facility	Partner with [LA partners] for Merchant EFW Facility	Partner with [LA partners] to develop dedicated EFW facility	Continue current EFW arrangements	Continue current EFW arrangements	Develop own Treatment EFW facility (LCC waste only)	Develop own Treatment EFW facility (LCC waste + 3rd party waste)
	Merchant capacity for pre-treatment / shredding bulky waste	Develop own pre-treatment / shredding facility	Merchant capacity for pre-treatment / shredding bulky waste	Develop own pre-treatment / shredding facility	Develop own pre-treatment / shredding facility	Merchant capacity for pre-treatment / shredding bulky waste	Develop own pre-treatment / shredding facility	Develop own pre-treatment / shredding facility	Develop own pre-treatment / shredding facility
	Option A	Option B	Option C	Option D	Option E	Option F	Option G	Option H	Option I
Deliverability									
Operational resilience									
Cost resilience									

Figure 4: Shows the risk profile of the nine options

Including the above factors resulted in a conclusion that a merchanting approach for the treatment of residual waste is the best option with the caveat, that partnership merchanting could be cost effective, if the partnership is straightforward to negotiate and subsequently, to manage. This result aligns with the Council's current management approach.

The output in terms of strategic level carbon modelling showed that all realistic options resulted in no discernible variation in environmental impact although it should be noted that environmental impact of waste management will reduce with the forecasted reduction in waste arising alongside changes in composition.

Conclusions

The conclusions of the output report are as follows:

- a) The report recommends a low investment merchanting approach to the management of residual waste either through continuing current arrangements (option F) or through re-merchanting arrangements from 2031 (option A).
- b) The output highlighted that due to the uncertainties, particularly around energy prices and ETS legislation, EFW profitability could not be assured and in the worst case, could be significantly more expensive than continuing or renewing merchanting arrangements.
- c) The report estimated that re-merchanting (option A) would be slightly more cost effective than the continuation of current contracts (option F).

However, due to the relatively small difference in cost and the challenges encountered with previous procurement, the Council should consider both as options (effectively they are both likely within a reasonable margin of error).

- d) The estimated management costs for partnership merchanting were within a small percentage of the overall estimated cost of residual waste management which highlights that the cost of working with partnerships (increase logistical and management challenges) could outweigh the benefits of more competitive gate fees through higher tonnages.
- e) It is anticipated that by 2050/51 the volume and composition of residual municipal waste will change significantly with the introduction of a number of waste reforms. Whilst the overall quantity of residual waste to be managed is projected to reduce significantly, the cost of managing the waste will increase, particularly due to ETS legislation.
- f) Whilst the consultancy work was not designed to provide future costs, it is noted from the outputs that the Council's revenue expenditure for residual waste treatment and disposal will likely increase marginally, as a result of the following factors:
 - i. The impact of the introduction of EfW to the scope of the ETS from 2028;
 - ii. Market variability and uncertainty for power prices, including the possible extension of the Electricity Generator Levy (currently scheduled to be withdrawn in March 2028).

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