



CASE STUDY

NOVEMBER 2017

ADVANCE INFORMATION

This material is issued prior to the examination session on 8 November 2017.

Candidates MUST bring this material with them to the Examination Hall.

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R4 WASTE COLLECTION AND RECYCLING LIMITED (R4): ADVANCE INFORMATION

This Advance Information is issued prior to the examination session so as to allow you to familiarise yourself with the information provided and to undertake any other appropriate research and analysis. The Advance Information is also published on the website: www.icaew.com/students.

You MUST bring this Advance Information with you to the Examination Hall, annotated if you wish, together with any other notes of your preparatory work. You must carry out sufficient and appropriate analysis work **of your own** in order to have a detailed understanding of the Advance Information. You should also undertake any additional research and analysis you feel necessary to enhance your awareness of the industry and market context and to enable you to clarify any technical terms or other issues of vocabulary. You will need to be able to refer back quickly to the Advance Information and your notes during the exam; you are therefore unlikely to benefit from taking large quantities of additional material with you into the Examination Hall.

At the start of the examination you will receive some additional material which will complete the description of the case scenario and state the Case Study requirements. Your answer must be submitted on the paper provided by the ICAEW in the Examination Hall. Any pre-prepared papers, or papers comprising annotated exhibits from the case material, included in your answer **WILL NOT** be marked.

Assessment of the Case Study

The marks in the Case Study are awarded for professional skills, allocated broadly as follows:

- | | |
|--|-----|
| • Assimilating and using information | 20% |
| • Structuring problems and solutions | 25% |
| • Applying judgement | 25% |
| • Drawing conclusions and making recommendations | 20% |
| • Demonstrating integrative and multidisciplinary skills | 5% |
| • Presenting appropriate appendices | 5% |

Of the total marks available, 15% are awarded for the executive summary and approximately 10% for the relevant discussion of ethical issues within your answer to the requirements. Ethical issues do not form a specific requirement but, within a requirement, may cover such topics as:

- Lack of professional independence or objectivity
- Conflicts of interest among stakeholders
- Doubtful accounting or commercial practice
- Inappropriate pressure to achieve a reported result.

You should be clear that marks are awarded for demonstrating your professional skills, not for reproducing facts from the case. In order to be successful, you will need to:

- Demonstrate your knowledge of the case material and make use of your research;
- Carry out relevant analysis of the problems and structure your proposed solutions;
- Apply your judgement on the basis of the analysis that you have carried out; and
- Draw conclusions from your analysis and judgement, and develop them into practical commercial recommendations.

Omitting any one of these elements will have a significantly detrimental effect on your chances of success.

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November 2017 Case Study: R4 Waste Collection and Recycling Limited

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About you, Nik Harris; your employer, Boyle Downer ICAEW Chartered Accountants (BD); and your client, R4 Waste Collection and Recycling Limited (R4)

You are Nik Harris, a final-year trainee ICAEW Chartered Accountant working at Boyle Downer (BD), a firm of ICAEW Chartered Accountants that has operations throughout the UK. You are based at BD's office in Sheffield (a city in the north of England) and work in the business advisory unit. You report to the partner responsible for client development in the business advisory unit, Shan Patel.

One of the firm's recently-acquired clients is R4, a company which operates in the industrial and commercial waste collection and recycling industry. BD has had previous experience of working with similar clients. R4 is based approximately 20 kilometres from the centre of Sheffield, close to a major motorway. R4's main recycling site and offices are located near the large town of Barnsley, from where it draws much of its business and where most of its workforce lives.

Since you joined the business advisory unit, your work has included:

- Analysing clients' financial statements to understand their business and to identify financial issues and concerns relating to their financial activities, as well providing clear advice to clients based on that analysis
- Assessing the markets in which clients operate, identifying changes or trends in those markets and any potential opportunities or threats by reference to the related strengths or weaknesses of clients
- Performing additional financial data calculations and further financial analysis, to identify and evaluate additional business opportunities or risks and the related financial benefits or costs
- Assessing financial and non-financial information provided by, or affecting, clients to evaluate its provenance and to perform a critical qualitative and quantitative review of the issues arising
- Providing clear opinions and reasoned judgements on issues presented by clients or matters which you consider important for any decisions facing those clients
- Drafting reports for clients on the financial and commercial aspects of their business, including business trust and ethical issues.

You are expected to keep yourself up to date and be aware of the political, economic, market and technical issues affecting the clients you deal with in order that you can contribute as fully as possible to all of the above tasks.

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The UK waste collection and recycling industry and R4

The UK waste collection and recycling industry

The UK waste collection and recycling industry comprises the whole process of the commercial collection of waste, of whatever variety, and its reprocessing, by segregation and transformation, into reusable products (recyclates). It also includes the final disposal of non-recyclates as fuel or landfill.

The UK waste industry is dominated by a number of big national operators, including subsidiaries of international businesses, which invest heavily in major facilities, but there are also a vast number of smaller companies. These exist as specialist collection and recycling operations on a local, product-based or specific commercial contract basis. Their collections include general office waste, confidential paper waste, food waste, farm waste, construction and demolition waste.

As a result, the UK recycling sector of the industry can be seen as fragmented and competitive in terms of the number and variety of companies operating in it. Despite this, it is also considered to be a network-based industry because many competitor organisations often work together to share major facilities and expertise in the recycling process.

Another apparent contradiction is that many organisations involved in the recycling sector are also heavily involved in initiatives designed to promote the production of less waste – such as the reduction in packaging of goods. The promotion of these initiatives could be seen as reducing the very materials, and the basis, from which the recycling sector earns its revenue.

The setting of international targets, by organisations such as the EU, has resulted in National Governments and Local Authorities (public sector bodies which run local affairs) creating initiatives and recycling targets aimed at reducing the amount of general (non-recyclable) waste being generated. In order to achieve these targets, financial incentives and penalties have been set in place. Many of these targets have to be met by commercial waste recycling organisations.

Definition of recycling

Recycling is the process of collecting and converting waste materials into reusable products. The general purpose of recycling is to preserve resources and reduce the costs of manufacturing by reusing materials wherever possible – an example being the recycling of paper in order to reduce the consumption of trees in the paper manufacturing industry.

Recyclable materials include the many different kinds of plastic, glass, paper and cardboard, metal, rubber (including tyres), as well as textiles and electronics. The composting or other reuse of biodegradable waste – such as food or garden waste – is also considered to be recycling.

Recent history of recycling in the UK

During most of the 20th century, the majority of commercial refuse and household rubbish in the UK was collected and taken to landfill sites – where it was burned or buried. These landfill sites were mainly owned and operated by Local Authorities for a nominal charge. In the 1980s and 1990s, the volumes of rubbish increased but the availability of landfill sites and the acceptance by the public of their operations began to decrease. Local Authorities were running out of land where rubbish could

be dumped and the general public was becoming increasingly aware that this activity was potentially hazardous and wasteful. Increasing the level of refuse recycling as much as possible became a national concern. From the beginning of the 21st century, the charges for using landfill sites began to rise progressively, forcing the rubbish collection and disposal industry to change. Recycling is now a massive and complex commercial activity.

In order to inform their customers and the general public about all the positive aspects and nature of their operations, many of the larger recycling organisations have comprehensive websites which explain their activities. A search through the websites of any of these companies reveals excellent portrayals of their recycling business with informative videos of the various processes as well as diagrammatic presentations or animations of their main activities. These include:

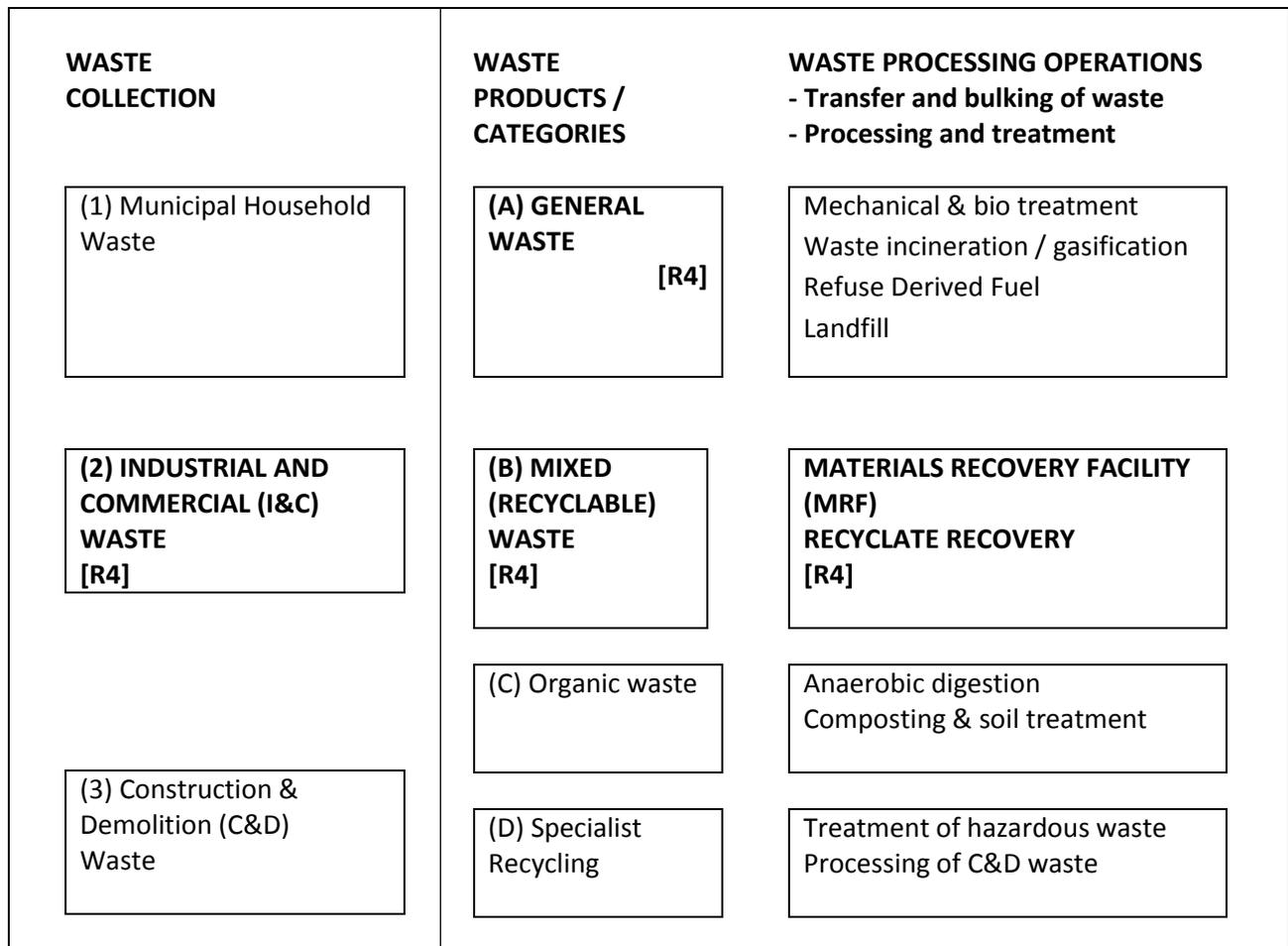
- Viridor Limited (Pennon Group)
- Veolia in the UK
- Suez Environment UK (formerly SITA)
- Biffa Limited
- FCC Environment

UK waste collection and recycling industry size

The total value of the UK waste collection and recycling industry was estimated at £15,300 million in 2015 – of which a significant proportion relates to industrial and commercial (I&C) waste collection and processing. The value of the whole industry is forecast to grow at a compound annual growth rate of 4.9% in the period 2016 to 2020, driven by a combination of price and volume increases.

UK waste collection and recycling industry operations (and R4)

The diagram below shows the main operations which form the basis of the UK waste collection and recycling industry. Activities which are highlighted in bold represent those conducted by R4.



Notes to the diagram

Waste collection

- 1) Municipal household waste collection is the largest sector in the UK recycling industry. Every Local Authority is involved in the regular collection of household waste (frequently outsourced to commercial recycling organisations) by way of house-to-house collection rounds. Householders pay for this service through local taxes. Householders are expected to segregate their rubbish into recyclable (mixed) and non-recyclable (general) elements. (R4 is not involved in this activity.)
- 2) Industrial and commercial (I&C) waste covers the collection and processing of waste from clients such as manufacturers, offices, retail and distribution centres. Contracts are negotiated between I&C clients and recycling companies based on volumes and the nature (mixed / general) of the waste to be collected. This activity ranges from weekly (or daily) collection from clients, through to one-off collections for specific event waste contract operations (SEWCOs). (R4 is involved in this activity.)
- 3) Construction and demolition (C&D) waste is generated both by the surpluses which need to be removed from construction sites and by the reclaiming of materials which arise from the

demolition or renovation of existing sites. In the past, the removal of such waste was relatively inexpensive and was hardly costed into building projects. Nowadays, the cost is huge and demolition companies in particular have become ruthlessly adept at sifting old building materials to reclaim the maximum and to minimise final waste quantities. (R4 is not involved in this activity.)

Any of these three categories of waste collection can be undertaken by a main waste contracting company or by 3rd party waste collectors. 3rd party waste collectors are identified as such because they negotiate collection contracts with the I&C client but, because they do not own any recycling or other waste disposal facilities (WDFs), they are obliged to use the waste processing facilities managed by other organisations. The waste that they have collected can involve any of the waste categories (described below), which is/are then fed into a waste processing operation. (R4 is involved in processing 3rd party waste collection.)

Waste products / categories and the related processing operations

A) General waste is one of the main categories of any waste collection and processing operation – and the term is used to define waste that is non-recyclable. Some of this general waste can be processed, by way of mechanical or biological treatment, to produce commodities which can be sold or used in waste incineration or gasification processes (generating usable gases), or some other form of Refuse Derived Fuel. Only very large recycling companies have made the significant financial investment in the necessary WDFs to be able to process and utilise general waste in this way. Such companies collect and process waste under contracts negotiated with their clients – such as the collection of municipal household waste under contracts from Local Authorities. These companies also charge other waste collection companies for the use of their WDFs. (R4 makes use of the WDFs of other companies.)

The final disposal of the vast majority of general waste is into landfill sites. Most landfill sites are owned either by Local Authorities or by very large recycling companies. Landfill is considered to be the last resort in the recycling process and the high charges for using these sites are meant to discourage their use. As well as occupying a lot of space and being subject to hostility from neighbours, owing to the antisocial nature of the work, nowadays most landfill sites involve very complex engineering structures and controls. This ensures maximum degrading of landfill products and the safe extraction and control of any landfill gases or possible contaminated waste water run-off. (R4 uses landfill sites run by other organisations.)

B) Mixed (recyclable) waste is processed through a Materials Recovery Facility (MRF), which produces recyclates (the segregated recyclable end-products from an MRF) as well as a residual element of general waste. The recyclates can be sold. Most mixed waste passes through some form of MRF in order to achieve this segregation. The recyclates (plastic, metal, glass etc) are eventually sold to manufacturing companies, which save money and resources by using these products. Final (non-reusable) waste is disposed of through the WDFs of those companies which process general waste or by disposal to landfill (A). (R4 has its own MRF.)

C) Organic waste can be used in two main processes: anaerobic digestion; composting and soil treatment. Anaerobic digestion is a complex process involving a very high level of investment in plant and machinery. It consists of a series of biological processes in which micro-organisms break down biodegradable material (such as waste food products) in the absence of oxygen. One of the end-products is biogas, which is combusted to generate electricity and heat or can be processed

into renewable natural gas and transportation fuels. Composting and soil treatment involves a longer process and needs a lot of space in order that components, such as farm waste, are allowed to degrade and produce compost materials. (R4 is not involved in this process.)

- D) Specialist recycling involves the safe final disposal of hazardous waste, for example chemical waste and hazardous building waste (such as asbestos). Only a small number of companies in the UK is involved in these extremely specialist activities and their services are very expensive. (R4 is not involved in these activities.)

Recycling organisations and revenue generation

Recycling organisations, including R4, generate revenue in two main ways.

1. Charging clients for general and mixed waste collection

Recycling organisations enter into contracts with clients such as Local Authorities or commercial organisations for the collection of waste. Fees are dependent on the type of waste, the quantities collected and the frequency of collections.

Recycling organisations that own MRFs, WDFs or landfill sites can also charge other recycling organisations a so-called gate fee for using these facilities, based on types of waste (mixed or general) and tonnages to be processed.

2. Sale of end-products

The end-products of the waste collection and recycling process are:

- Recyclates – extracted from sorted mixed waste items (such as paper, cardboard, metals, plastics, or glass) usually within an MRF – sold to commercial customers
- Heat and power – generated by Refuse Derived Fuel or waste incineration
- Gas – from tapping landfill sites or from other gasification processes
- Soil and compost – derived from recycling organic waste
- Aggregates – construction materials derived from Construction and Demolition recycling.

These end-products can be a source of revenue for the recycling companies which produce them. Recyclate products can be sold to customers (commercial organisations) both in the UK and abroad (for example, Chinese commercial organisations are amongst the biggest customers for cardboard waste). This enables those customers to reduce the use of other resources in creating or generating further products or services.

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R4: history and overview

R4 operates a number of business lines collecting and dealing with waste, which are all integrated to some extent:

- materials recovery facility (MRF) (**Exhibit 7**)
- industrial and commercial (I&C) waste contract operations (**Exhibit 8**)
- special events waste contract operations (SEWCO) (**Exhibit 9**)
- recycling network arrangements and operations – use of other companies' WDFs (**Exhibit 10**).

R4 started out as a business idea shared by a number of like-minded managers who worked in the waste collection industry. Following a change to the waste collection operations in their locality, they were faced with redundancy and decided to use their previous experience in this industry to start their own I&C waste collection operation. Following research and analysis, they based this new business near the large town of Barnsley in the north of England.

R4 facilities

R4's I&C waste collection and current recycling operations are based on a large leasehold site, known as Fairleigh, which is used by R4 as a waste collection vehicle park and offices. This site, which is leased from the Local Authority, is close to the M1 motorway, which links Sheffield with Leeds – two important cities in the north of England. Many of R4's I&C recycling clients are located within 30 kilometres of R4's site (stretching from Sheffield to the south to the outskirts of Leeds to the north). The location of Fairleigh is important for the logistical organisation of the collection of waste from clients using the most efficient concentration of clusters of clients and the shortest routes – in order to minimise collection costs.

Increased demand and expansion of R4's operations, linked to the changing nature of the recycling business, meant that in October 2009 the company decided to invest in its own small MRF in order to be able to segregate the mixed waste it collected. The Local Authority approval for this MRF was conditional on an R4 local job-creation scheme. It also meant that R4 would be assisting the Local Authority in meeting its recycling targets for the locality in subsequent years.

R4's employment and training plan involved recruiting local school leavers and others who had not been in full-time work for the past twelve months to offer employment and training in the waste disposal industry. The eventual aim was that R4 would train these employees to become qualified mechanics, engineers or truck drivers. They would then be able either to remain with R4 or to seek other employment with their qualification.

R4 recycling activity and waste disposal

R4's operations involve the collection of waste from I&C clients using a fleet of collection vehicles. The client contracts specify whether the waste is mixed waste (and therefore expected to be almost fully – that is, 90% – recyclable) or is considered to be general waste. Because of the recyclable nature of mixed waste, a lower fee is charged for its collection than for the collection of general waste. At the outset, R4 just collected all types of waste from its clients and used the facilities of larger recycling organisations to process that waste. From 2009, R4 started to process the mixed waste that it collected using its own MRF, while continuing to use other organisations' WDFs to process general waste.

For the eventual sale or disposal of the mixed waste recyclates, R4 deals with a number of major organisations based throughout the UK, which purchase the recyclates for use in their manufacturing processes. One such organisation is Commercial Plastic Products Limited (CPP) which uses recycled plastic in its manufacture of plastic bottles for the UK milk supply industry. Based just south of Sheffield, CPP collects recycle plastic from R4 (and other similar organisations) on a daily basis.

Another recycle customer is Metal Rebound Limited, which buys recycled steel. About two-thirds of all cans sold in the UK are made of steel, including many food (canned vegetables) and drink (canned fizzy drinks) containers, as well as such things as paint and aerosol cans – all such steel can be recycled repeatedly. R4 organises the transport of recycle steel to Metal Rebound Limited whenever it has accumulated a sufficiently large quantity for a truckload – usually on a daily basis. This continuous process of disposal avoids any build-up of recyclates at Fairleigh and the site is kept clear and under control. As a result, R4 holds no inventory of recyclates.

R4 has to balance a number of important factors in all its operations:

- It is aware of the UK public's complicated attitude to recycling – most people believe that it is an important and worthwhile process but their actions do not always match their ideals and they recycle less than they might. R4 tries to avoid appearing too sanctimonious in its recycling policy and marketing information.
- There is also the problem of the actual activity of recycling, which by its very nature involves dealing with the waste and rubbish generated by clients. Although it is a cleansing operation, recycling is not in itself a clean activity. As much as possible, R4 avoids generating local opposition to its activities.
- In such a potentially hazardous industry, health and safety standards are a major priority, and R4 has an exemplary record in this area. Because of the poor image (dirty, dangerous, polluting and noisy) of the recycling industry, R4 makes every effort to act responsibly in relation to its local community in and around its location. This includes active involvement in local matters of concern relating to the environment; helping to organise a variety of schools education programmes; sponsoring local events; and the general promotion of the company as one with high ethical standards despite the industry's poor image.

Currently the board and senior managerial posts are held by:

Tam Dooley	Managing Director (20% shareholder)
Jackie Tong	MRF operations Director (20% shareholder)
Mina Singh	I&C waste operations Director (20% shareholder)
Ali Mann	Special event waste operations Director (20% shareholder)
Rickie Caper	Logistics and maintenance Director (20% shareholder)
Freda Tusk	Finance Director (an ICAEW Chartered Accountant)
Shen Ling	Head of IT and company website manager

EMAIL

From: Freda Tusk
To: Shan Patel
Subject: R4 financial and operational history and review of management accounts for the three years ended 30 September 2016
Date: 7 November 2016

Further to your firm's appointment as our business adviser, please find attached a combined set of management accounts for the three years ended 30 September 2016, together with related notes (**Exhibit 5**). This is a business which operates on a regular level of activity throughout the year but there are peaks and troughs of activity caused by the SEWCO work.

Some general points

- The leasehold improvements to the Fairleigh site (including changes to buildings and new road layout) are depreciated over the remaining life of the lease – included under operating costs
- Depreciation rates for other non-current assets are:
 - MRF: using tonnes of waste processed during the financial year against total expected lifetime tonnage
 - Other plant & machinery and IT: 5-25% reducing balance
 - Vehicles: 15-25% reducing balance
- Disposal proceeds are shown in the notes under each non-current asset category (and as a total in the statement of cash flows)
- In the R4 management accounts, depreciation and losses on disposal on these other non-current assets, are included in cost of sales, and are deemed to be allowable expenses for tax purposes.

Prior to October 2013

- Every year since R4's formation in 2002 it achieved a steady expansion of operations and revenue
- In April 2009, R4 made an investment of £3.8 million in a small MRF in order to process mixed waste on its Fairleigh site. The investment was funded by a 10-year 6% £3 million bank loan together with R4's own funds. This was an interest-only bank loan with the £3 million principal to be repaid in April 2019
- After 2009, as a result of the investment, R4's collection and on-site processing of I&C mixed waste increased steadily year-on-year
- There was also a year-on-year increase in R4's collection of general waste to be processed at other organisations' locations using their facilities. This was achieved by a steady expansion of R4's fleet of collection trucks that each carry 7 tonnes of waste (this is a standard truck size).

Year ended 30 September 2014

- R4 continued to process all of its own clients' I&C mixed waste at Fairleigh
- R4 expanded its on-site processing of 3rd party mixed waste and, as a result, reached the MRF capacity at Fairleigh
- There was continued replacement of upgraded vehicles for the collection of mixed waste and general waste
- R4 increased its collection of general waste from clients using a larger fleet, better route planning and two collection rounds per day to maximise I&C general waste collection
- R4 continued to use the local WDFs of other organisations to process the general waste collected from I&C clients.

Year ended 30 September 2015

- In April 2015, R4 made the decision to invest £14 million in a larger MRF for its Fairleigh site with significantly increased capacity (suggested lifetime processing capacity of 1.2 million tonnes or 120,000 tonnes per year)
- The original MRF, which was considered by R4 to be economically obsolete for its purposes, was sold, with a loss on disposal, to an overseas buyer
- At that time (April 2015), R4 maintained the old 6% bank loan of £3 million (repayable in April 2019) and added a new 6% loan of £9 million repayable in April 2025. Both loans are secured on R4's non-current and current assets
- Other conditions of the bank loan were that the existing five shareholders should each increase their investment in R4 by way of new share capital (in total, an additional 1,000,000 ordinary shares of £1 each at par). The bank also insisted that no dividends were to be paid for five years
- Overdraft facilities were increased to £1.5 million to cover fluctuations in working capital
- The I&C operations and processing of mixed waste increased at Fairleigh from May 2015
- There was also an increase in 3rd party processing of mixed waste at Fairleigh from May 2015
- As a result of the review of operations during the year, R4 was able to divest itself of some older, no longer profitable, contracts and to obtain some new, bigger I&C waste contracts
- R4 increased the size of its workforce to cope with the change and the increase in activity
- During this financial year, there were increases in cost of sales caused by the losses arising on disposal of the old MRF – which were offset by the improved efficiencies in the second half of the year – and the increase in depreciation related to the new MRF
- The working capital position deteriorated to the extent that the R4 overdraft limit of £1.5 million was almost breached (shortly before the financial year end).

Year ended 30 September 2016

There is a review of the year to 30 September 2016 and more detail on each of the main business operations following the management accounts.

R4 Waste Collection and Recycling Limited
Management accounts for the three years ended 30 September 2016

Statement of profit or loss

Year ended 30 September

		2016	2015	2014
		£000s	£000s	£000s
	Note			
Revenue	1	50,998	42,167	40,428
Cost of sales	2	(42,952)	(36,489)	(35,535)
Gross profit		8,046	5,678	4,893
Operating costs		(6,356)	(4,919)	(4,492)
Operating profit		1,690	759	401
Finance charges		(879)	(562)	(269)
Profit before taxation		811	197	132
Taxation		(162)	(40)	(27)
Profit after taxation		649	157	105

Statement of financial position

As at 30 September

		2016	2015	2014
		£000s	£000s	£000s
Non-current assets				
Tangible assets	3	15,724	16,677	4,743
		15,724	16,677	4,743
Current assets				
Trade and other receivables	4	7,872	5,435	5,180
		7,872	5,435	5,180
Total assets		23,596	22,112	9,923
Shareholders' equity				
Ordinary share capital		1,500	1,500	500
Retained earnings		2,119	1,470	1,313
Total shareholders' equity		3,619	2,970	1,813
Non-current liabilities				
Bank loan	5	12,000	12,000	3,000
		12,000	12,000	3,000
Current liabilities				
Trade and other payables	6	6,591	5,716	4,747
Bank overdraft		1,386	1,426	363
		7,977	7,142	5,110
Total equity and liabilities		23,596	22,112	9,923

Statement of cash flows
Year ended 30 September

	2016	2015	2014
	£000s	£000s	£000s
Profit before tax	811	197	132
Adjustments for:			
Depreciation & loss on disposals	1,914	3,177	1,151
Net finance expenses	879	562	269
	3,604	3,936	1,552
Change in trade and other receivables	(2,437)	(255)	(949)
Change in trade and other payables	753	956	256
Cash generated from operations	1,920	4,637	859
Taxation paid	(40)	(27)	(9)
Net finance expenses	(879)	(562)	(269)
Net cash from operating activities	1,001	4,048	581
Investing activities			
Purchase of tangible assets	(990)	(15,546)	(802)
Proceeds from disposal of tangible assets	29	435	54
Net cash used in investing activities	(961)	(15,111)	(748)
Financing activities			
Issue of new share capital	-	1,000	-
Issue of bank loan	-	9,000	-
Net cash (used in)/from financing activities	-	10,000	-
Net change in cash and cash equivalents	40	(1,063)	(167)
Cash and cash equivalents at start of year	(1,426)	(363)	(196)
Cash and cash equivalents at end of year	(1,386)	(1,426)	(363)

Notes to the management accounts

Note 1 Revenue (all UK)

	2016	2015	2014
	£000s	£000s	£000s
Mixed waste	18,786	13,856	12,975
General waste	32,212	28,311	27,453
	50,998	42,167	40,428

Note 2 Cost of sales

	2016	2015	2014
	£000s	£000s	£000s
Mixed waste	14,233	11,377	10,761
General waste	28,719	25,112	24,774
	42,952	36,489	35,535

Note 3 Non-current assets

Tangible assets

	Leasehold Improvements	IT, Plant & Machinery	Vehicles	Total
Cost or valuation	£000s	£000s	£000s	£000s
At 1 October 2013	824	5,112	4,855	10,791
Additions	-	124	678	802
Disposals	-	(68)	(538)	(606)
At 30 September 2014	824	5,168	4,995	10,987
Depreciation				
At 1 October 2013	440	2,055	3,150	5,645
On disposals	-	(39)	(397)	(436)
Charge for the year	49	538	448	1,035
At 30 September 2014	489	2,554	3,201	6,244
Carrying amount at 30 September 2014	335	2,614	1,794	4,743
<i>Note: proceeds on disposals</i>	-	6	48	54
Cost				
At 1 October 2014	824	5,168	4,995	10,987
Additions	246	14,548	752	15,546
Disposals	-	(4,240)	(620)	(4,860)
At 30 September 2015	1,070	15,476	5,127	21,673
Depreciation				
At 1 October 2014	489	2,554	3,201	6,244
On disposals	-	(2,032)	(458)	(2,490)
Charge for the year	83	703	456	1,242
At 30 September 2015	572	1,225	3,199	4,996
Carrying amount at 30 September 2015	498	14,251	1,928	16,677
<i>Note: proceeds on disposals</i>	-	350	85	435
Cost				
At 1 October 2015	1,070	15,476	5,127	21,673
Additions	-	166	824	990
Disposals	-	(44)	(474)	(518)
At 30 September 2016	1,070	15,598	5,477	22,145
Depreciation				
At 1 October 2015	572	1,225	3,199	4,996
On disposals	-	(30)	(395)	(425)
Charge for the year	83	1,264	503	1,850
At 30 September 2016	655	2,459	3,307	6,421
Carrying amount at 30 September 2016	415	13,139	2,170	15,724
<i>Note: proceeds on disposals</i>	-	4	25	29

Note 4 Trade and other receivables

	2016	2015	2014
	£000s	£000s	£000s
Trade receivables	7,157	4,779	4,569
Prepayments and sundry	715	656	611
	7,872	5,435	5,180

Note 5 Bank loans

	2016	2015	2014
	£000s	£000s	£000s
Initial loan	3,000	3,000	3,000
Additional loan	9,000	9,000	-
	12,000	12,000	3,000

Note 6 Trade and other payables

	2016	2015	2014
	£000s	£000s	£000s
Trade payables	5,617	4,987	4,153
Other payables	974	729	594
	6,591	5,716	4,747

EMAIL

From: Freda Tusk
To: Shan Patel
Subject: Review of R4 business operations for the year ended 30 September 2016
Date: 9 November 2016

I am attaching a set of documents to provide an explanation of the company's business operations:

- Materials Recovery Facility (MRF) (**Exhibit 7**)
- industrial and commercial (I&C) waste contract operations (**Exhibit 8**)
- special events waste contract operations (SEWCO) (**Exhibit 9**)
- recycling network arrangements and operations – including use of other companies' WDFs (**Exhibit 10**).

I am also attaching a brief summary of the organisations which form part of R4's network of operations (**Exhibit 11**), and the R4 board's most recent review of management accounts, corporate responsibility, operations and strategy (**Exhibit 12**).

Year ended 30 September 2016

The 2016 revenue and cost of sales for the revenue streams are set out below. Further details are in the notes that follow the table and in subsequent exhibits.

<u>Mixed waste</u>	Notes	Revenue	Quantity	Cost of	Gross
<u>I&C operations</u>	(below)	£000s	processed	sales	profit
			Tonnes	£000s	£000s
I&C mixed waste fees	a	5,265			
I&C recyclate sales	b	2,438			
		<u>7,703</u>	28,350	6,225	1,478
<u>SEWCO</u>					
SEWCO fees	c	3,328			
SEWCO recyclate sales	d	3,385			
		<u>6,713</u>	11,475	4,257	2,456
<u>3rd party waste collectors</u>					
3rd party gate fees	e	825			
3rd party recyclate sales	f	3,545			
		<u>4,370</u>	41,216	3,751	619
Total mixed waste		18,786	81,041	14,233	4,553
<u>General waste</u>					
I&C general waste	g	31,103	120,960	27,648	3,455
SEWCO general waste	h	1,109	3,825	1,071	38
Total general waste		32,212	124,785	28,719	3,493
Overall total		50,998	205,826	42,952	8,046

Notes

- a I&C mixed waste fees are calculated as the total number of bin collections or lifts multiplied by the charge per lift. The breakdown of revenue and collection costs is given in **Exhibit 8**.
- b I&C recyclate sales (sales of sorted mixed waste commodities or materials) are based on an average sales figure derived from the mix of recycled, sorted materials as explained in **Exhibit 7**. The MRF processing costs are also provided in that exhibit.

I&C mixed waste fees and recyclate sales give the total revenue for I&C operations for the total quantity (tonnage) collected and processed. The cost of sales comprising all collection and processing costs is similarly linked to the total tonnage.

- c The average SEWCO fee in the year ended 30 September 2016 was £290 per tonne. The average cost of collection was £280 including the cost of landfill charges. Special night work shifts and overtime are included, as well as other local operating costs (**Exhibit 9**).
- d SEWCO recyclate sales depend on the recyclate mix, which tends to be of higher value than the usual I&C recyclate mix (**Exhibit 9**). The overall average for SEWCO recyclate sales was £295 per tonne (net of any residual general waste) during the year ended 30 September 2016. Nearly 75% of all SEWCO waste collected was deemed to be mixed waste. SEWCO mixed waste is processed as a separate exercise at Fairleigh.

SEWCO fees and recyclate sales combined provide the total for SEWCO mixed waste revenue. The SEWCO revenue from general waste processing is shown below in **h**.

- e Gate fees of £20 per tonne for processing mixed waste were charged to all 3rd party waste collectors who used R4's MRF in the year ended 30 September 2016 (**Exhibit 10**).
- f The average recyclate revenues and the MRF processing cost per tonne (**Exhibit 7**) are the same as **b** above because the waste accepted from 3rd parties for processing tends to be processed alongside and mingled with R4's own mixed waste.

3rd party waste collectors provide a large percentage of the mixed waste processed by R4.

- g Fees from I&C general waste are based on £18 per lift. R4 pays a disposal fee of £100 per tonne to other waste operators to have this general waste disposed of, as well as incurring its own collection costs – shown as a combined total (**Exhibit 8**).
- h Fees from SEWCO general waste averaged £290 per tonne. The average costs of collecting all SEWCO waste (mixed or general) during this year was £280 per tonne. 25% of all waste collected from SEWCO sites was immediately identified as general waste and processed at other companies' WDFs and landfill sites (**Exhibit 9**).

Additional analytical commentary

- The investment in the new MRF has allowed a substantial increase in R4 mixed waste operations. As a result, R4 processed significantly more of both its own mixed waste collections and those of 3rd party collectors at Fairleigh during this financial year.
- Items **a** to **f** above all pass through R4's MRF. R4 processed more than 81,000 tonnes in this full financial year – but this is well below the estimated annual capacity of 120,000 tonnes.
- The gross profit margin target for R4 is 25% on all mixed recycling. Overall R4 is achieving below that target but there are variations in each of the three main mixed waste categories which affect that overall percentage.
- R4 also has an overall tonnage target ratio of mixed waste to general waste of 40:60.
- General waste collection and disposal is a much higher volume activity with a lower gross profit margin. However, its financial contribution of £3,493k towards covering R4's overheads is significant.
- R4 continues to incur expenditure on replacement trucks to ensure that it has both the appropriate number and specification of truck for the type of work conducted. A number of older trucks, which were becoming inefficient or were no longer appropriate for R4 activities, were disposed of during the year. These incurred a loss on disposal.
- Some additional investment was made in IT and plant and machinery to enable R4 to control its logistics operations more efficiently.
- The increase in operational activity throughout the year has been the result of winning work from larger clients, who have negotiated longer credit terms. As well as the increase in activity, these longer credit terms have resulted in an increase in year-end trade receivables.
- R4 came close to, but did not exceed, its £1.5 million overdraft.

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R4: Materials Recovery Facility (MRF)

Investment

During the financial year ended 30 September 2015, R4 replaced and upgraded its existing MRF with an improved and more powerful version. The new MRF was fully functional by the beginning of May 2015 and this enabled R4 to process mixed waste more rapidly and more effectively.

The new MRF cost just over £14 million to purchase and install. R4 expected it to be able to process 1.2 million tonnes of waste over its useful life. It should be able to process approximately 120,000 tonnes of waste each year.

R4's bank financed the majority of the new investment by providing a £9 million loan which would be repayable in 10 years (April 2025). R4 generated the remainder of the necessary funding from its operations and paid the MRF supplier over an extended period of months. R4 continued to owe its bank £3 million from a loan due for repayment in April 2019.

One of the bank's conditions for providing the new loan was that the five directors who were equal shareholders (each holding 100,000 £1 ordinary shares) would each increase their investment of share capital in R4 from £100k to £300k (thereby increasing total share capital from £500k to £1.5 million). The bank was of the view that this increased investment would demonstrate the commitment and confidence of the R4 board in its own proposal as well as providing a buffer in the event of failure. The bank also took out a fixed charge over the MRF and other non-current assets as well as a floating charge over R4's current assets.

Operations of the MRF

The new MRF segregates mixed waste into its recyclate components more efficiently than the previous facility. This means a speedier process and less of the waste processed being sent to a general waste disposal process (either WDF or landfill). However, there is always some final general waste (currently 10% of all mixed waste) which follows that path. This process means that the sale price of the recyclate loads – which depends not only on the weight of materials but also on the quality of each load – is easier to negotiate and confirm prior to despatch to the eventual purchaser of the recyclates.

The operation of the MRF, which runs seven days a week, is a labour-intensive process. The collection of mixed waste normally occurs from Monday to Friday. There are some weekend I&C client waste collections and there are also collections from special events as and when required. The trucks containing mixed waste are all weighed on a weighbridge on entry. They are weighed again on exit and the difference is the weight to be processed. This exit weight is also used to agree gate fees charged to 3rd party waste contractors who bring their mixed waste loads to R4 for processing. These weight records are used to provide details of the tonnage of weekly and annual mixed waste processing.

As each truck tips its load inside one of R4's vast warehouses at the start of the process, it is inspected by R4 staff to agree that the content is mixed waste and is appropriate for processing by R4 on-site. Loads can be rejected because they contain obviously inappropriate substances or an obviously large percentage of non-recyclable general waste. Sometimes the load is too wet and therefore its recyclable weight cannot be agreed. In the case of 3rd party contractors, these rejected loads may be reloaded immediately by R4

mechanical loaders and no further processing occurs, or they can be processed at a higher cost to the 3rd party.

Where non-recyclable material (usually only a very small percentage) has been collected by R4 during its own mixed waste rounds, every attempt is made to identify the client involved. Where this is possible, the matter is raised with the client with a view to preventing further similar problems – it also includes a discussion of the appropriate fees to be charged. The vast majority of these incidents are simple mistakes caused by the wrong type of waste being put in the wrong bin, or the bin being left open and becoming subject to rainwater flooding. A discussion between R4 and the client is usually sufficient to change client activity. An increasing number of problems are caused by incidents of low-quantity fly-tipping (illegal dumping of waste). This can happen where I&C bins are accessible to passers-by who use the opportunity to discard their unwanted items into these bins. Increased security and vigilance by R4 clients is one solution to the problem.

It is impossible to identify all instances of inappropriate material or general waste at the start of the mixed waste process and so all the accepted mixed waste brought onto the Fairleigh site is passed through the R4 MRF. On average approximately 10% of all mixed waste is not recyclate and becomes final general waste to be taken to other organisations' WDFs or landfill for disposal. This non-recyclable waste is subject to the general waste disposal fee of £100 per tonne (see below).

The MRF comprises a series of input channels or belts onto which waste is loaded by mechanical loaders. This waste is segregated in stages such that the recyclable components of the waste (the recyclates) are drawn into separate channels – for example, paper, cardboard, metals, (steel / aluminium), hard plastics, plastic film and glass. These recyclates are then compressed and bundled before being despatched to the organisations that purchase them.

Maintenance

An expensive and complex piece of heavy plant and machinery such as the R4 MRF requires constant maintenance. R4 has tried to ensure that its MRF is always fully operational when required – any breakdown would be extremely disruptive and expensive in terms of lost earnings. Continuous maintenance takes place selectively, overnight where possible, and any major maintenance occurs during less busy times at weekends. R4's qualified engineers are always on hand in case they are required at any time. Similarly, R4 uses its own mechanics to service its fleet of vehicles, which collect all waste.

MRF revenues and costs

The MRF must earn sufficient revenue to cover its costs. It has two major sources of revenue: gate fees (which are charged to 3rd party contractors) and revenue from the sale of recyclates.

The vast majority of the MRF's costs are fixed and therefore the aim is to maximise the amount of waste being processed each day in order to spread those costs over the largest possible recycling tonnage.

Processing of mixed waste for 3rd party contractors (averages)

Revenue for R4 (per tonne)	£	£
Gate fees from 3rd party mixed recycling loads (per tonne)	20	
Net revenue from recyclates (see below)	<u>86</u>	
		106
MRF costs		
Wages	40	
Machinery repairs and maintenance	16	
Electricity	12	
Baling wire	6	
MRF overheads including depreciation	<u>17</u>	
		(91)
MRF gross profit per tonne recycled		<u><u>15</u></u>

Net revenue

I&C mixed waste comprises various recyclates with a range of different sales prices. The average percentage mix – comprising the most common materials – and the average sales prices of recyclates in the year ended 30 September 2016 were as follows:

	Composition per tonne %	Sale/(cost) per tonne £	Weighted sale/(cost) per tonne £
Paper	20	80	16
Cardboard	30	100	30
Steel	8	150	12
Aluminium	2	500	10
Hard plastics	10	200	20
Plastic film	5	100	5
Glass	<u>15</u>	<u>20</u>	<u>3</u>
Recyclable	90		96
Non-recyclable waste	<u>10</u>	<u>(100)</u>	<u>(10)</u>
Net revenue from recyclates	<u>100</u>		<u>86</u>

Although it would appear that the most desirable items to have in mixed waste are those with the highest sales price per tonne, the reality is that, for example, an individual glass bottle weighs much more than an item of plastic film and so collecting a tonne of glass is much easier to achieve.

The same information applies to the processing of mixed waste collected by R4 itself, except that in place of the 3rd party gate fee there is the collection fee per lift charged to R4 clients – see **Exhibit 8**.

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R4: Industrial and Commercial (I&C) waste collection and recycling operations

History

R4 has specialised in industrial and commercial (I&C) waste collection and recycling operations since its inception. A combination of factors has determined that policy. Firstly, a number of the founder members knew this type of operation from past experience. Secondly, other recycling markets were deemed inappropriate for a variety of reasons. For example, municipal household waste collection and recycling requires a much larger operation and a different collection and recycling process; while construction and demolition waste is the domain of either very large contractors or much smaller niche operators whose business is based heavily on personal contacts.

R4 has successfully bid for work and then developed long-term working relationships with a number of major commercial organisations. These relationships are based on R4 providing a waste collection service which its I&C clients consider to be economic, efficient and effective.

Collection services

R4 operates its collection services by way of a collection truck visiting each I&C client location to collect waste from large (commercial size) waste collection bins. These bins have a capacity of 1,100 litres – although the weight of waste within the bins can vary according to the content being discarded and how compact the waste is within the bin. In general, the weight of waste within a bin averages 70 kg. The bins have rollers or wheels which enable them to be moved around manually even when they are full. The collection trucks are fitted with mechanical loading arms which enable the bins to be lifted mechanically and the waste deposited inside the truck. The trucks' internal mechanism includes a compressor system which can compact the rubbish collected.

Following a successful bid for work by R4, the logistics planners, under Rickie Caper, establish the client's collection service as part of a collection route (or 'round'). The planning for rounds is crucial both for client satisfaction and for the efficiency and profitability of the I&C service. Some large clients require a daily collection service of a number of bin loads from multiple locations. Other clients may only require a weekly collection service from a single location with a single bin.

Clients are charged on the basis of the number of bins for each category of waste which R4 collects – see calculation and indicative prices below. The two main categories of waste are: (i) mixed waste and (ii) general waste. Clients may request additional collections to meet increased needs because of seasonal or other factors. Where these potential additional collections were part of the original bid information, they are charged at the same rate as other collections. Where they are considered an extra service, the rate may be increased.

R4 operates with an in-house fleet of collection trucks that each carry 7 tonnes of waste. Separate vehicles are deployed for the two different types of collection (mixed waste and general waste).

R4 uses the following approximations to determine the collection costs and charges for I&C waste collection services per lift.

Mixed waste collection per lift

Cost per 1,100-litre bin (70 kg)	Per 70 kg lift Mixed waste
	£
Fuel	1.20
Manpower	3.30
Vehicle costs	1.50
Overheads including depreciation	3.00
Total costs	9.00
Price charged to I&C client	13.00
Gross profit per mixed waste lift	4.00

Notes

1. All R4 mixed waste collected is processed through the Fairleigh MRF
2. The cost of processing the mixed waste is given in Exhibit 7
3. Throughout the year, trucks make an average of 100 lifts per working day
4. Taking holidays, maintenance and breakdowns into account, trucks operate 225 days per year

General waste collection per lift

Cost per 1,100-litre bin (70 kg)	Per 70 kg lift General waste
	£
Waste disposal (per 70 kg lift (average) = £100 per tonne)	7.00
Fuel	1.20
Manpower	3.30
Vehicle costs	1.50
Overheads including depreciation	3.00
Total costs	16.00
Price charged to I&C client	18.00
Gross profit per general waste lift	2.00

Notes

- 1) All general waste is processed through 3rd party WDFs
- 2) No other direct R4 costs or processes are involved apart from the collection costs above
- 3) The waste disposal cost of £100 per tonne payable by R4 comprises the gate fee payable by R4 of £20 per tonne for use of another organisation's facilities plus a UK government landfill tax of £80 per tonne

Landfill tax is the name for the mandatory UK government charge for the disposal of general waste – whether or not general waste ends up in actual landfill or other WDF process.

R4: Special event waste contract operations (SEWCO)

Special event waste contract operations (SEWCO) relate to specific events such as music festivals, major sports tournaments, royal commemorations, as well as horse racing meetings, riding events, road races such as the London Marathon, and major flower shows. Locations can vary and the events can last from as little as one day through to two weeks. What they all have in common is that vast numbers of people attend, generating and leaving behind them enormous quantities of waste. Most special events occur in the months April to September.

In most instances, particularly where a festival site is normally used for a different activity for the rest of the year (such as farming or public parkland), there is a requirement for the event organiser to return the festival site to its former pristine condition as quickly as possible once the event finishes. As a result, waste contractors are commissioned by event organisers to remove all waste from the site with the maximum possible speed. This waste collection and removal can be one of the major costs of running such events.

To save costs, many event organisers use a system whereby those willing to help with the site clearance at the end of the event can attend the event free as well as being paid for their work. This happens at the world-famous Glastonbury Music Festival, where helpers collect and segregate the waste, ahead of the arrival of the waste collection contractors. They are also charged with leaving the festival site “cigarette butt clean” (that is, back to its completely pristine state) – a challenging task if the event has been subject to heavy rain which turns the site ground into a sticky, muddy mess.

Although site visits and waste collections can occur throughout an event, the majority of the waste collection work starts once the event ends. At that stage, fleets of large trucks and special crushing equipment, together with teams of personnel, must be available to be deployed to scoop up the vast tonnage of waste. Over the years, R4 has become a specialist in providing waste collection services for these events. As a result, it has built up a good base of SEWCO customers, which rely on R4 for its waste collection services on a repetitive basis.

Although such festival sites may use a series of the 1,100-litre bins (and other much larger bins), the volume of waste generated usually overwhelms this provision. A problem facing waste contractors is the fact that one tonne of waste, if not compacted, can occupy a huge amount of space – equivalent to the inside volume of an iconic London double-decker bus.

Festival organisers pay a fee for site clearance which is based on expected tonnages of waste to be removed. This is negotiated and fixed in advance.

For R4, the work involves bringing its experienced labour teams and equipment onto the festival site. They start by performing an initial segregation into mixed and general waste. Using mechanical lifters, special crushers and compactors on-site, they reduce the volume of waste and enable its efficient clearance. Trucks then transport the compacted waste off-site.

General waste is taken to the nearest WDF and the appropriate fees are paid. Segregated mixed waste is usually transported back to Fairleigh for processing. The initial segregation of waste is key to the success of this operation. The higher the percentage of mixed waste, the greater the profit for R4. Skill and past experience are crucial to this operation.

Festival example

It may be estimated that a festival will generate 2,000 tonnes of waste during the event. This must be initially collected and segregated, crushed, transported off-site and processed.

From experience, R4 might calculate the cost of collecting, crushing and transporting all waste off-site as being on average £250 per tonne. This would include the estimated cost of all gates fees and landfill tax payable to a WDF for any general waste collected and all additional transport costs to bring any mixed waste to Fairleigh.

The fixed fee then might be agreed with the client at £260 per tonne, giving total fee revenue of **£520,000**, meaning a minimum profit of **£20,000** for the event. However, the profit could be higher than this, if (for example) 60% of all waste collected from the festival could be recycled by R4 through its MRF (as shown in the following calculation). R4 would then find itself in a much more profitable position.

Example of specific recycle mix from one SEWCO music festival

	Mix	Sale price	Weighted
	%	per tonne	sale price
		£	per tonne
Paper and cardboard	10	90	9
Steel	20	150	30
Hard plastics	30	200	60
Aluminium	40	500	200
	<u>100</u>		<u>299</u>

Additional revenue of 60% x 2,000 tonnes @ £299 per tonne would be **£358,800**.

Note: The R4 MRF costs per tonne of processing such mixed waste from special event recycling operations must be set against the revenue generated from the sale of the mixed recycle from the event. As shown in Exhibit 7, this processing cost averages £91 per tonne.

Achieving success in winning SEWCO work and making it profitable means making the initial bid as low as possible – to cover all costs and provide some margin – in order to win the work, but then achieving the maximum additional recycle revenue. This requires a mixture of sensible bidding, based on prior knowledge and then experienced, skilful segregation of waste on-site, followed by appropriate processing.

Success in this work means assessing many factors about those attending an event and any rules or regulations which might apply. A music festival is much more likely to attract a younger audience – whose drinks of choice may be served in cans. A book festival may attract an older audience whose drink of choice may be hot tea or coffee in a takeaway cup. Certain events ban the sale of any drinks in glass bottles and glass containers – because of the danger that broken glass poses to participants.

Good fortune can also help. The weather can increase or decrease the number of visitors attending an event. Bad weather causes problems of collection and weight of recycles – making the whole venture less efficient and more costly to process. It also affects prices for certain recycles: prices for wet paper and soggy cardboard, for example, are much lower.

R4: Recycling network arrangements and operations

The recycling network

Recycling involves a number of processes, some of which can involve large land space use, or in other instances costly specialised equipment (anaerobic digestion systems or waste incineration or gasification plant). These assets and processes are within the financial reach of only a small number of large recycling organisations. (See **Exhibit 2**.)

It might, therefore, be considered that these organisations hold all the control in this industry. However, because of the high costs of running the specialised operations and the need to achieve economies of scale, they are in fierce competition with each other to encourage as many of the smaller waste contractors as they can to use their facilities. As a result, good and fair working practices and relationships exist between the larger and smaller enterprises throughout this industry. The effect is that strong networks are established.

Similarly, location of facilities and processing capacity are important for efficient operations within this industry. Larger organisations ignore competition and liaise with each other for use of facilities to match location and customer demand when the need arises.

Recycling for 3rd party collectors by R4 of their I&C mixed waste

R4 is engaged in processing mixed waste collected by 3rd party contractors through its MRF in Fairleigh throughout the full 52 weeks of the year. These 3rd party contractors have many different contracts with their clients to collect mixed waste, which they then need to process.

An example of such recycling by R4 for a 3rd party waste contractor is the R4 client ZQ Recycling Limited (ZQ) (see **Exhibit 11**). ZQ has a series of specific mixed waste contracts: it collects confidential paper waste and cardboard from different offices – there is no residual general waste. ZQ charges its clients sufficient to cover all its operating costs, plus the R4 gate fee to deposit the mixed waste at Fairleigh that it has collected, plus its profit margin.

From a visual inspection of ZQ trucks, R4 establishes the recyclate mix on ZQ contracts. R4 can make the following estimates (per tonne) on ZQ waste recycling contracts:

R4 contract with ZQ	£
	Per tonne
Gate fees charged to ZQ for its mixed recycling loads	20
Sale of ZQ mixed recyclate (see below)	90
	<hr/> 110
MRF processing costs (per tonne – Exhibit 7)	(91)
Gross profit for R4 (per ZQ tonne recycled)	<hr/> 19 <hr/>

3rd party (ZQ) recyclate composition

	Composition per tonne	Sale price per tonne	Weighted sale price per tonne
	%	£	£
Paper	50	80	40
Cardboard	50	100	50
Total ZQ mixed recyclate	<hr/> 100 <hr/>		<hr/> 90 <hr/>

This is an example of a good 3rd party contract for R4. There is no residual general waste to reduce profit margins and this type of mixed waste is easy to process.

In other instances of 3rd party collectors, there can be different (lower) margins caused by varied mixed waste proportions and/or higher residual general waste elements.

Use of other of companies' waste disposal facilities (WDFs) by R4

R4 makes extensive use of a number of other waste processing organisations to deal with the general waste that it collects. All the major recycling companies in the UK have numerous WDFs located throughout the UK which R4 utilises. These WDFs include processing through waste incineration facilities, anaerobic processors, mechanical and bio treatment plants, as well as landfill sites.

R4 uses other companies' WDFs to process the general waste that it collects from I&C clients or from special events. R4 also uses these WDFs for the final disposal of any residual waste from the mixed waste processing at its own MRF. The main factor in choosing a processing organisation is geographical but the choice is also influenced by R4 trying as hard as possible to avoid the use of final landfill sites.

The revenues and costs for I&C general waste recycling are as indicated in **Exhibit 8**. General waste disposal incurs a higher gate fee at these WDFs because all general waste is subject to a landfill tax per tonne. This landfill tax is meant both as an incentive to persuade organisations, and the companies collecting waste, to sort the waste between mixed and general, and also to ensure that an appropriate penalty charge is made for the antisocial practice of simply dumping all waste into landfill sites.

R4's major costs associated with running its waste collection service are related to the vehicle fleet: fuel, insurance, maintenance, vehicle depreciation, drivers' and operatives' wages and other linked costs. R4 attempts to minimise these costs by careful route planning to maximise the number of collections and lifts from clients grouped together in one district, alongside an agreement with another recycling organisation based nearby to utilise its WDF.

The same cost minimisation approach with regard to the vehicle fleet is used for recycling from special events. R4 will seek an agreement with recycling organisations based close to the event site which have the capacity and facilities to recycle the general waste collected in a WDF – rather than transport general waste back to its local region.

In most cases, provided that there is an agreement negotiated in advance, these costs do not vary much between WDF proprietors. The charges to be paid by R4 for the use of these WDFs always include a full landfill tax element.

R4: 3rd party mixed waste collection organisations

R4 has a number of 3rd party mixed waste collection organisations which make regular use of the MRF at Fairleigh, as well as a large number of occasional collectors who process their mixed waste collections on a less frequent basis.

Regular users all have contracts with R4 for at least 12 months – some for as long as three years – which tend to match the duration of their own collection contracts with their waste collection clients. The main terms of these contracts with R4 are that they can use R4's processing facility as and when required, and that they will be invoiced for tonnages processed as determined by the entry and exit weights of their trucks, provided that the mixed waste is within an acceptable range for R4 in terms of composition.

Lindon Waste Contractors Limited (LWC)

R4's largest 3rd party mixed waste collector is Lindon Waste Contractors Limited (LWC), which paid gate fees of more than £300,000 in the year ended 30 September 2016 (collecting and delivering to R4 more than 15,000 tonnes of mixed waste). LWC specialises in collecting a range of mixed office waste from local business organisations and since June 2015 has used the R4 MRF for all its waste processing activities. LWC has worked with R4 for a number of years but, following R4's expansion of MRF capacity, LWC has increased the tonnages it processes through the Fairleigh site. LWC is located 20 kilometres north of Fairleigh on the outskirts of Leeds. LWC is an excellent long-term customer: it pays promptly and provides R4 with a substantial amount of mixed waste work.

ZQ Recycling Limited (ZQ)

ZQ (see **Exhibit 10**) is a typical R4 3rd party mixed waste collector. It processed just under 2,000 tonnes of mixed waste through R4 in the year ended 30 September 2016 – averaging approximately one waste truck per day throughout the twelve months. Because ZQ is a reliable mixed waste contractor (the mixed waste is consistently of an appropriate quality) with a good range of small business clients, R4 has developed an excellent working relationship with ZQ. Whenever possible, R4 helps ZQ by accommodating, without additional charges, any changes to its waste processing requirements which may occur at short notice or under specific circumstances.

Other 3rd party recycling organisations

There are many recycling organisations who operate near the Fairleigh site and need to use an MRF for processing the occasional truckloads of mixed waste, but who are not regular customers. Some of these are large well-established recycling organisations who just want to make use of the nearest MRF on a one-off or occasional basis. Others are recycling contractors who have collected waste which could be recycled through an MRF.

Like all organisations, R4 is constantly seeking to grow its business, but it has a policy that all organisations who want to use the Fairleigh MRF have to give R4 at least 24 hours' notice of their intention to do so. In addition, all such organisations must provide licensing details for their vehicles and the appropriate licensing approval for collecting mixed waste, and they must identify where the mixed waste has originated.

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EMAIL

From: Tam Dooley
To: R4 board cc: Shan Patel
Subject: Management accounts review, corporate responsibility, operational and strategic review
Date: 7 November 2016

Following the recent board meeting, I am summarising the outcome of the discussions held on the review of the 30 September 2016 management accounts; R4's corporate responsibility and the updates on all operational and strategic risks – apart from the review and report on the operations of the MRF, which is the subject of a separate email from Jackie Tong (**Exhibit 13**).

2016 financial statements

- The board considered that the financial performance of R4 as shown by its statement of profit or loss to 30 September 2016 was an improvement both in absolute and percentage terms by comparison with 2015
- It appeared that the investment made in the new MRF, with its increased capacity, had allowed R4 to obtain and process more I&C mixed waste business. It was a good investment decision
- It also seems that the 2015 results were adversely impacted by the loss on disposal of the old MRF and the transitional operational changes and so were not necessarily a good historical comparative yardstick
- Board members questioned the size, calculation and impact on the financial statements of the estimates for depreciation both for the MRF and for the increasingly large R4 fleet of trucks
- There was a discussion concerning the impact of the interest payments for the new bank loan, and the effect this was having on profit and cash flow
- Some of the non-accounting board members did not feel as confident as others that they understood how the three main statements (profit or loss, financial position, cash flows) were integrated, or how the bridges and links between them were achieved.

Corporate responsibility

R4's position in the waste industry recycling chain means that it is integral to the supply of sustainable solutions for its stakeholders (clients, suppliers, purchasers of its recyclates, workforce and local community amongst others) and therefore corporate responsibility is at the heart of R4's business.

R4 believes that by acting responsibly it will both enhance its financial performance and create sustainable value for all stakeholders. R4 aims to ensure that its people, those with whom it works, its clients and service providers and the local community of which R4 is part, are made aware of the value that R4 places on its corporate responsibility. R4 endeavours to practise and disseminate that responsibility in this industry through participation and consultation.

The R4 corporate responsibility framework encompasses its people and the health, safety & wellbeing of its community. It includes its marketplace and the relationship with its customers, suppliers and other parties and its commitment to business trust, ethics and high standards of conduct.

R4 aims to lead the way in developing sustainable solutions for those with whom it works; cooperating with like-minded organisations that have similar aims and objectives; helping to educate and inform those that do not. R4's philosophy is that this is not something extra but integral to the way it operates.

Commercial risks: financial, operational and strategic

- R4 remains exposed to risks inherent in pricing contracts in its I&C operations – particularly with regard to any future major increase in landfill tax
- Significant fluctuations (particularly any drop) in recycle commodity prices could affect R4's revenues and gross profit
- Increases in power, fuel and other costs could affect R4's operating results
- R4 is subject to the risk of increased customer churn as a result of increased competition
- R4 faces risks arising from the acquisition strategy of large competitors
- Any significant disruption to R4's information technology system, or any delay during its migration to new systems, could adversely affect its performance
- As with all companies that use IT to run their operations and to plan and control such things as logistics, a major cybersecurity (ransomware) incident could negatively impact R4's business and its relationships with customers
- R4's operations expose it to the risk of material health and safety liabilities
- R4's business is in a heavily regulated industry so that any regulatory changes, or industry responses to those changes (which R4 would be required to match), pose a risk
- R4 is at risk of any significant change in consumer behaviour and attitudes concerning recycling
- R4's business depends on its reputation and the avoidance of any business trust issues
- As a smaller owner-managed business, R4 is dependent on its senior personnel
- R4 is reliant on its network arrangements for operational success
- There are potential financial risks related to R4's cash flow

The commercial issues identified above have all been considered by R4 and each one that could have a significant negative effect is kept under close review. Some of these issues can clearly have a potentially positive impact – for example: a reduction in fuel prices; or an increase in recycle commodity prices – but the upside of any of these issues, although it would be welcome, is not part of R4's strategic planning.

EMAIL

From: Jackie Tong
To: R4 board cc: Shan Patel
Subject: Report on MRF issues in the year ended 30 September 2016
Date: 16 October 2016

Despite the ongoing overall success of the operation of the new MRF, there are a number of specific concerns which need to be considered.

- This has been the first full year of operating the new MRF since the investment was made in April 2015. Good staff training and operational experience have meant that R4 staff have become familiar with the MRF requirements.
- Good regular maintenance in this financial year has proved its worth in that there were no major unforeseen stoppages during the year. We now have a good team of engineers and mechanics able to cope with all standard maintenance and replacement issues and with any one-off problems.
- During this financial year, R4 managed to process almost 40,000 tonnes of I&C and SEWCO mixed waste, and it also processed more than 40,000 tonnes of mixed waste from 3rd party waste collectors. Although there were some weeks when it was operating close to full capacity, this was not often the case.
- The effect of the recycling of the significant tonnage from 3rd party collectors was to bring the total volumes recycled close to the R4 agreed Local Authority recycling target of 40% of the total R4 waste collected and processed at Fairleigh.
- This target was agreed with the Local Authority as part of R4's planning agreement for the installation of this larger MRF and the new road layout for the new facility. It was agreed that the 40% target must be achieved after two years of these new operations and that the target should be raised by an additional percentage point each year thereafter for five years to achieve a 45% recycling rate by R4 on the Fairleigh site. Failure to achieve these targets would result in restrictions on general recycling tonnages.
- The new road layout is now working very well, allowing all the loaded mixed waste trucks the most direct route onto the site – with adequate parking lanes on-site to avoid any disruptive parking or excessive vehicle exhaust pollution on local public roads.
- The route away from the site is also very well designed and managed. As a result, trucks leave with minimal disruption to our neighbours.
- Although there is reduced vehicle activity at Fairleigh on any weekend (apart from any essential SEWCO event work) – with fewer 3rd party trucks and only a small number of I&C contract vehicles – the MRF operates seven days a week. R4 has had no complaints from neighbours about noise or other forms of pollution.

The main concern is that the MRF has been a major investment and R4 needs it to be operating closer to its full processing capacity every week.

R4 is always trying to win new mixed waste recycling business or, if unsuccessful, trying to ensure that those waste contractors that do win local contracts are encouraged to use the R4 MRF to process the mixed waste collected.

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National News**March 2017**

Household recycling rates in UK drop for first time in 2015

From information available for the year ended 31 December 2015, overall recycling rates in the UK have fallen for the first time since such data has been collected, prompting waste companies to call for a tax on packaging, and meaning that EU targets are now almost certain to be missed.

The amount of rubbish sent to recycling sites by householders had been steadily increasing for more than a decade, but more recently flatlined for three years. Now, new government figures show that the recycling rates in different parts of the UK, which vary considerably, are in overall decline in the year ended 31 December 2015.

The effect of this is that the UK as a whole is almost guaranteed to miss an EU target of recycling at least 50% of its household waste by 2020. The waste company Suez, which operates throughout the UK with more than a thousand waste collection trucks, called for a tax on packaging manufacturers that would pay to drive up recycling rates again. It said that the tax could operate on a sliding scale depending on how much of a product was recyclable and non-recyclable. "The UK is at a critical point in time and, without radical change to improve overall household and other recycling rates, the UK will not meet its EU (or UK transitional) agreed target of 50% recycling rates by 2020," said David Palmer-Jones, CEO for Suez recycling and recovery in the UK.

The government's main body tasked with cutting waste and driving up recycling is WRAP (Waste and Resources Action Programme). A spokesperson has stated: "Recycling is primarily the responsibility of Local Authorities and although there are underlying economic reasons for the decline in terms of funding and a fall in the value of commodities for some recycled materials, a very important factor in recycling rates is clear communication with householders about the value and benefits of recycling".

According to the UK's Office of National Statistics, the total amount of waste generated by households was slightly down in 2015, at 22m tonnes in total, or 407 kg per adult. Despite this fall, it seems that householders in the UK are still confused about recycling in respect of what they can put in mixed recycling and what needs to go in the general waste bin. The UK is now recycling four times as much as it was in 2000, but this dip in the household recycling rates clearly shows that more needs to be done.

It is also believed that this dip in household recycling rates reflects a wider change in the attitude towards all recycling. If people within households are not being diligent in that segregation and recycling process, it is probably also the case that they will not be disciplined or careful about recycling in places of work or leisure areas.

The need to recycle

The need to persuade more individuals and organisations to recycle is urgent but is fraught with contradictions and conflict. One of the most significant issues is that although the planet is being overwhelmed by waste, effective recycling is still not a universally accepted activity. The evidence for this absence is everywhere: beside beautiful country lanes, in the middle of supposedly pristine oceans and in the wonderful endless domain of outer space, countless tonnes of waste are evident. This accumulation is caused by carelessness, negligence, wilful indifference, and increasingly by criminal actions. This problem of fly-tipping (illegal tipping of rubbish on unauthorised land) has now reached industrial proportions in parts of the UK.

Any solutions offered to increase the rate of recycling can often lead to the acceleration of the problem. At one end of the scale, the setting of targets for recycling involves being able to measure what should be and what is recycled. The targets set can be the subject of disagreement and dispute. With target setting comes some sort of reward for success and some form of punishment for failure – even if in both cases that simply means good or bad publicity. However, more often it means some form of financial reward or financial penalty and that can lead to actions which go directly against the intended goal.

The intention of those bodies who charge high landfill tax fees for disposal of unsegregated, general waste is to encourage waste sorting and recycling. But the unintended consequence is that the high charges become a deterrent from using authorised landfill sites – and fly-tipping is the result. The economics of this activity can be easily understood. If it costs £100 per tonne to use an authorised landfill site and a fly-tipper is the owner of a truck carrying 20 tonnes of general (anonymous) waste, then dumping it at the side of a country lane at night saves £2,000. If that is done five nights a week then, despite having charged clients a legitimate disposal fee, fly-tippers begin to make significant illegal “savings” – regardless of the cost to others.

Unfortunately, the Central Government and Local Authorities have no immediate solution to the problem of illegal dumping practices. Short of the unrealistic solution of having cameras set up on every green field in the UK and a police force and court system to prosecute all offenders, a more inventive solution must be found or developed. To a large extent, it all depends on both the attitude of the public and that of the offenders towards one thing – the need to be motivated to change. As any regulatory body knows, there is the old saying “if you can solve that one, then just tell us how”. It probably needs somebody to come up with a solution using some form of effective, but unobtrusive, persuasion – incorporating some form of Nudge Theory – to change these antisocial actions.

City News

May 2017

The storm in the (disposable) coffee cup

Every day in the UK, millions of Britons throw away up to seven million takeaway coffee cups – that is more than 2.5 billion cups in a year – and although many are placed into a recycling bin, only about 0.25% of these cups (only 1 in 400) are thought to be recycled. Large numbers of cups are binned in offices each day as people arrive at work or pop out for coffees throughout the day. The question is: How can more of these cups be recycled?

The answer to the question “Can coffee cups be recycled?” is “Yes” – but not alongside standard household or paper recycling. Confusingly, the cardboard sleeve that insulates a coffee cup, preventing a customer’s hand getting burned, can be recycled. Because this sleeve often shows the famous recycling symbol of the little Möbius-Loop – the three arrows in a triangle – it makes it look as though the coffee cup itself can be recycled too, but this is not the case.

The takeout cups that are the stock-in-trade of High Street coffee giants such as Starbucks, Caffè Nero and Costa (amongst others) are currently almost impossible to recycle. To make these cups waterproof, the card is fused with polyethylene, which provides a plastic film lining. This material cannot be separated out again in a standard recycling mill. But they are technically capable of being recycled – a fact that enables coffee companies to describe them as “recyclable”. However, the reality is that this is only possible in highly specialised recycling facilities, of which there are currently only two in the UK.

There are two different recycling processes that can work with coffee cups, and although currently small in scale, the companies involved are working to increase their capacity at the moment. The first shreds the whole coffee cup, processing it into a resin. This resin is mixed with recycled plastic to create a new plastic material which can be manufactured into a range of new products, from pens to park benches. The second pulps the coffee cup and separates out the paper and plastic. The recovered paper fibres are used to make tubes and cores for a variety of products. Both processes are expensive.

Change may occur and solutions may be found. Consumer pressure may drive the uptake of specialist recycling services by retailers – but it may need a financial incentive (or penalty) provided by regulation. A major company may help by producing a wider range of desirable and commercial products from the recycled cups – but that would need to grip the market to be successful. Offices may invest in an education programme that might motivate their workers to support the recycling effort. This would need to be accompanied by specialist recycling bins – linked with the enforcement of more stringent recycling rules, plus financial incentives (by recycling companies). Individual coffee drinkers may change behaviour – but as with the plastic bags previously issued free by shops, any change might only occur by charging customers a fee for each non-recyclable coffee cup.

Most of the major waste management companies are clear: currently, coffee cup recycling is too difficult and too expensive. Firstly, there is no established or financially acceptable commodity price for these items – which waste management companies could use for their planning. Secondly, the fact that only a few such recycling facilities exist in the UK means that waste management companies would incur heavy transport charges getting waste coffee cups to these facilities. The problem is that without a better push for change, the majority of coffee cups collected by waste collection operators are destined to be treated as general waste and will end up in landfill or other fuel facilities. In an age of trying to maximise recycling, this is no longer acceptable. The result is that there is an increasing storm brewing in the coffee cup waste disposal activity.

International Times

June 2017

Rome rubbish powers Austrian homes

Twice a week, in the early evening, from a little-known municipal train station on the outskirts of Rome, an unremarkable looking train starts a remarkable journey. This freight train is hauling airtight containers which contain around 700 tonnes of compressed waste from Italy to Austria. Rome is exporting its expensive waste.

After years of facing a crisis in the disposal of its rubbish, the Local Authority in Rome is paying the Austrian company EVN to dispose of up to 70,000 tonnes of Roman household refuse a year. This symbiotic relationship works because EVN had spare capacity at a waste-to-energy plant near Vienna where the Italian refuse is incinerated and turned into hot flue gas. This gas generates steam which is utilised by a neighbouring power station to produce electricity. The electricity powers nearly 200,000 homes in Austria.

As a result, Rome has found a solution to its overwhelming rubbish crisis and EVN's thermal waste utilisation plant is able to operate at full capacity. It may seem counter-intuitive to carry rubbish over 1,000 kilometres before disposing of it, but it is part of efforts in the EU to make cities reduce the amount of waste that goes into expensive and increasingly controversial landfills.

Rome, like many large cities, faces the problem that its landfills are full – and some are already a big environmental problem, and need to be closed. Landfill creates a lot of methane emissions, which can be extremely dangerous in terms of uncontrolled fires and explosions, as well as generating harmful CO₂ with its environmental impact.

The head of the EVN thermal waste plant in Austria has stated, "Transporting this waste is an environmentally friendly solution and both parties to the transaction win". Given the similar problem faced by so many cities, not just in Europe but around the world, this international solution may need to be recycled more widely: rubbish trains may be the key.

Cleaning up the beaches – plan for reusing plastics waste

Beaches strewn with plastic waste have become a graphic illustration of just how much plastic we use in everything from food packaging to cosmetics, and how much of it gets thrown away. Now a limited edition shampoo bottle, made from recycled ocean plastics, is to go on sale in France. An initiative by consumer goods giant Procter and Gamble (P&G) means that it has become the latest company to attempt to show that it is tackling a specific waste problem.

In announcing plans for a limited run of a shampoo in bottles made partly from plastic waste collected by volunteers on France's beaches, P&G is following adidas, which put 7,000 pairs of trainers made from marine plastics on sale in November, and Pharrell Williams, whose clothing line for G-Star RAW has featured denim containing plastic from the oceans.

P&G expects to manufacture up to 170,000 of its special edition bottle, produced in collaboration with recycling business TerraCycle and waste management firm Suez. Despite its limited size, in terms of the millions of plastic bottles used in sales of similar products every year, it may be the biggest deployment of marine and beach plastic ever.

Other recycling industry analysts have commented that this breakthrough – and its potential knock-on effects for recycling of challenging materials in general – is significant because it points the way forward for innovation in all areas of waste recycling. Their conclusion is that technology is developing and future economies of scale may be achieved for all sorts of items – currently seen as comprising difficult recycle material – to become reusable. It just needs other major companies to follow the P&G and adidas manufacturing examples.