

# Briefing note – Developments in the MRF industry

## 1 Introduction

There have been a range of developments in the waste sector which could impact on the Sherbourne Resource Park Delivery Project; in particular, there is much discussion around packaging policy and recycling collection strategy in the UK and beyond. This briefing note is intended to provide a high-level view of the various challenges and opportunities facing the MRF industry and recycling market in general, followed by a view on how the Sherbourne project is addressing these. This briefing note has been prepared by Frith Resource Management Ltd and provides an independent opinion.

## 2 Developments in the recyclate market

The recyclate market has historically been underpinned by fluctuations in price. This is unlikely to change in general due to the multiple supply, demand and other influences on materials commodity, such as oil prices. Moreover, in the short term, there is scope for additional volatility due to uncertainties surrounding the effects of Covid-19 and Brexit. One aspect of the recycling market that is likely to continue and grow is the focus on quality, with innovation, operational practice and technological developments evolving to respond to increasing demands for high quality. Aside from demands from the market, increased quality (and quantity) of recyclate is also being driven by national and EU policy and the Circular Economy (see Section 4.1) which will have an impact over the longer term.

### 2.1 Quality & Technology

Since the MRF Regulations were introduced in 2014, and when China announced it was closing its doors to contaminated recyclables from the start of 2018 in its National Sword policy, there has been an increased emphasis on quality in the recycling markets. Other export markets have followed this lead, particularly in South East Asia, leading to UK MRFs focusing on improving the quality of recyclable materials, often through enhanced sorting practices. Following the tightening of import quality standards in 2018, from January 2021, China will no longer be accepting or approving 'solid waste' imports. High-grade copper, aluminium and ferrous scrap merchants are calling for the Chinese government to consider these material streams as a 'resource' rather than a waste.<sup>1</sup>

Some MRF operators are responding to the quality challenge by basic approaches to increasing manual pre-sorting and slowing down the MRF conveyor belt<sup>2</sup>, which can reduce capacity. Others are looking towards technological improvements to target different materials via optical and sensor-based sorting and robotics, with massive strides in the development of deep learning algorithms and artificial intelligence for material identification by MRF equipment providers<sup>3,4</sup>.

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<sup>1</sup> <https://www.recyclingtoday.com/article/houlihan-lokey-lek-consulting-summer-2020-outlook/>

<sup>2</sup> <https://www.letsrecycle.com/news/latest-news/mrfs-running-at-slower-speed-to-improve-quality/>

<sup>3</sup> <https://resource.co/article/mrfs-look-future>

<sup>4</sup> <https://www.letsrecycle.com/news/latest-news/recycleye-gains-funding-for-mrf-sensor-technologies/>

Tag and trace technology, for identification and accountability, was trialled in the UK last year through packaging compliance scheme company Ecosurety<sup>5,6</sup>. Tag and trace technology allows brands to 'tag' their packaging with a unique PAC code, allowing the packaging to be 'traced' and sorted and reprocessed into identical grades and colours of plastic. The technology requires tagged packaging to be separately collected and processed at a Polytag MRF, therefore having the potential to remove material from the kerbside recycling scheme if the technology is widely adopted by brands.

## 2.2 Recyclate prices and markets

Recyclate market prices are subject to variation and fluctuation, depending on factors including, but not limited to, supply, demand, quality, the price of virgin materials and the demand for the final products. A summary chart showing the average monthly market prices of recycled materials is shown in Figure 1 (Figure 1: Recyclate market prices, collated from Let's Recycle published data). Actual market prices achieved for MRF outputs may also depend on contractual arrangements, the markets supplied, and the quantities sold to each market. Further detail on each of the material grades is available for inspection by the Project Board if required.

The data shows the fluctuations in market prices over the last 10-11 years. It can be seen that the prices over the last year have been fairly volatile for plastic bottles and paper. Plastic bottles of all grades (PET, HDPE, mixed and coloured) saw increases in price during 2019 and the early part of 2020, but these have now reduced closer to the long-term average prices. This fluctuation could be due to increased reprocessing capacity coming on line in the UK and businesses responding to demands for higher recycled content, as referenced in WRAP's 2019 Plastics Market Situation Report<sup>7</sup>. The price of recycled plastic grades might be expected to increase in coming years with demand for recycled content in plastic packaging (see Section 4.3.1 below).

The price of all paper and card grades was seen to fall over 2019, to a 10-year low in the early part of 2020 but are now increasing once more. The current price for paper is still c.30-50% lower than the 10-year average. This point follows a summary document from FRM to the Project Team in November 2019, in which it was reported that the industry<sup>8</sup> expected paper prices to recover as reprocessing capacity comes on line in South East Asia, while UK markets will continue to struggle without investment in UK paper mills.

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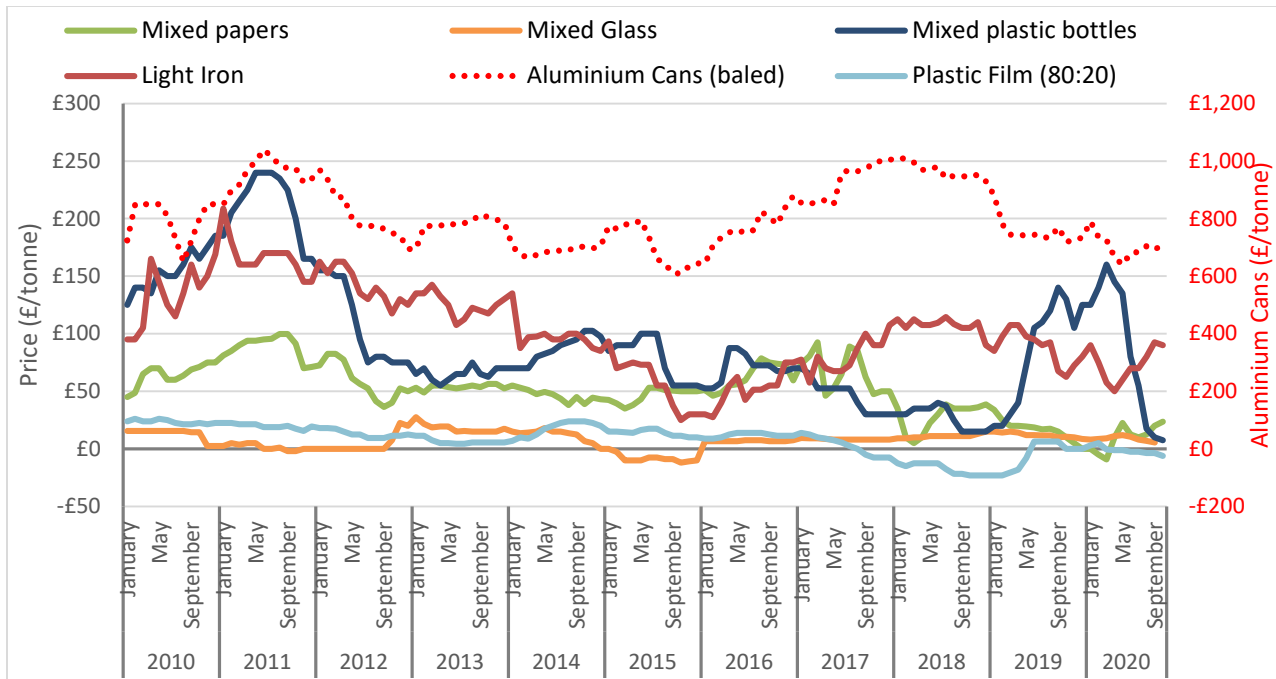
<sup>5</sup> <https://www.packagingnews.co.uk/news/waste-management/ecosurety-funds-tag-trace-packaging-recycling-technology-trial-28-10-2019>

<sup>6</sup> An update on the trial has been requested from Polytag but has not yet been forthcoming

<sup>7</sup> Plastics Market Situation Report 2019, WRAP

<sup>8</sup> <https://www.letsrecycle.com/news/latest-news/waste-paper-prices-at-ten-year-low/>

Figure 1: Recyclate market prices<sup>9</sup>



The recyclate market has been impacted by Covid-19; to a certain degree this was due to the short term effects of interruptions to household collections, coupled with the significant reduction in trade waste tonnages and increases in arisings from households affecting supply and demand, as well as the availability of reprocessing capacity. Local authorities are still experiencing c.12% increases in the tonnage of dry recycling from households (above the ‘norm’). Shorter term effects of Covid-19 on recyclate markets could lead to an oversupply of material to the market as “normality” resumes, which would drive down prices; conversely, there has been a shortage of Packaging Recovery Notes in the market, which should push material market prices back up<sup>10</sup>. The longer-term effect of Covid-19 on recyclate markets is uncertain.

The effects of Brexit offer additional uncertainties in the recycling markets and will depend on the shape of any trade deals with Europe. From January 2021, additional controls will be placed on waste movements between the UK and the EU<sup>11</sup>, which could add administrative cost to the export of recyclables, which could adversely impact market price. However, the UK relies on export of recyclables to countries outside the EU, which should be unaffected by Brexit or the UK’s trade deals with the EU. Nevertheless, c.60% of paper is exported for reprocessing to EU markets including Italy, Spain and Germany<sup>12</sup>. The UK could also see investment in its domestic reprocessing capacity over the longer term as a reaction to these changes.

<sup>9</sup> Monthly average figures from [www.letsrecycle.com](http://www.letsrecycle.com)

<sup>10</sup> Webinar, Episode 3 – waste & recycling during the coronavirus pandemic: materials & markets, Environment Media Group, April 2020

<sup>11</sup> <https://www.gov.uk/guidance/importing-and-exporting-waste-from-1-january-2021>

<sup>12</sup> The Recycling Association (2020) MRF Conference.

### *Sherbourne Resource Park approach*

The Sherbourne Resource Park is designed to focus on producing quality recyclable materials to reduce the risk associated with market availability and price. The MRF equipment being procured is highly automated and will incorporate the latest technological advances. In addition to the use of technology to achieve high quality outputs, the process will include flexibility to target different materials depending on market demands, for example use of optical sorting units that can be recalibrated to target different material types, colours etc and replacing some manual pickers with robotic technology, increasing accuracy and efficiency. Additionally, space is being kept available within the facility equipment configuration for contingency, should new and further advanced equipment become available and/or additional material streams require processing during the life of the plant. High purity targets have been set within the specification to drive designs to deliver high quality outputs. Furthermore, the layout and design of the facility is such that at least three days storage could be provided for output recyclate, to allow the project to ride short term market price fluctuations, or to store recyclables prior to subsequent 'polishing' through the MRF to enhance quality further.

In addition, the project AssetCo intends to have within the management and operations team, skills and experience in materials marketing to enable AssetCo to negotiate beneficial offtake arrangements for MRF outputs. The intention is that UK and EU markets will be sought in preference to further afield to secure long-term sustainable markets and to avoid the potential for negative publicity associated with exporting waste.

The business approach of the project is that the Partner Councils would be exposed to recyclate market price through arrangements with commercial MRFs if the Sherbourne Resource Park was not going ahead, and that risk is best managed by the Partner Councils through the project. This is a bold statement but is reflective of the statutory duty of the Partner Councils to collect and / or manage recyclable materials from households. The gate fees are determined by the fixed operating costs, with the Partner Councils each taking recyclate risk through a recycling rebate based on the composition of feedstock and the market price achieved. Each of the Partner Councils have determined their 'worst case' position of receiving no recycling rebate and are therefore managing this risk directly. In addition, the business case is based on no income from third party C&I feedstock.

## 3 International MRF Perspective

The Circular Economy, environmental concerns over marine pollution and resource use and the carbon agenda are influencing waste management approaches in Western countries, including MRF developments, consequently driving up demand for high quality output materials.

### 3.1 North America

In North America, MRF operators are facing similar challenges to those faced in the UK; including a shortage of labour, diminishing 'news and pams' paper grades, and an increased variety of packaging materials, notably card and plastic alternatives (see Section 4.3.3). Export restrictions from international markets have led to an abundance of mixed paper and mixed plastics, driving down the prices for these materials and as such making it challenging to move<sup>13</sup>. In terms of throughput, there is a mixed picture from the largest MRFs across North America; some reporting increases, whilst others are decreasing,

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<sup>13</sup> <https://www.wastetodaymagazine.com/article/largest-north-american-material-recovery-facilities/>

potentially as a result of light-weighting and a continued decline in news and pams grades. Pre-sorting is common in North American and European MRFs to allow early removal of contaminants.

Most co-mingled MRFs in North America process glass using multiple disc screens. Many operators and waste contractors have had familiar discussions as those in the UK on the inclusion of glass within the co-mingled mixed dry recyclate stream. However, a study from the Closed Loop Foundation reported that investment in glass processing would make economic sense for mid to large scale facilities (processing over 10,000 tonnes of glass per annum)<sup>14</sup>. Some US facilities are reporting issues with quality combined with struggles to recruit, train, and retain employees within an already tight labour market. Operators have developed new pricing strategies in response. Upgraded and new facilities are being developed with robotic technology to become more efficient and cope with more lightweight packaging.

MRFs in the UK typically sort three grades of paper: old-corrugated cardboard (OCC), news & pams (periodicals and magazines), and mixed paper<sup>15</sup>. Some European MRFs sort into OCC and mixed paper whilst some MRFs in North America sort into six grades<sup>16</sup>.

### 3.1 Europe

The degree to which sorting facilities are required across Europe varies widely depending on the complexity of their design and the system for collection in place. However, across Europe, recycling is recognised as a key sector to achieve climate-neutral status. Several cities have committed to becoming fully circular and to driving down residual waste. Demand for waste recycling services in Europe is expected to increase significantly over the coming years, owing to improved collection, sorting and reprocessing of waste driven by policy instruments being implemented by government bodies to improve the capture and quality of materials. From a materials processing aspect, technologies such as artificial intelligence, and robotics are increasingly being used in MRFs to automate system and reduce the human element. There is also growing interest across Europe in tackling complex material streams including plastics, and there is increasing investment in technologies to recover low-grade plastic wastes. This is demonstrated by Loop and Suez which are investing in Europe's first dedicated 'Infinite Loop'<sup>17</sup> plastic recovery facility which aims to provide virgin quality, food grade PET<sup>18</sup>.

#### *Sherbourne Resource Park approach*

The three bidders remaining in the procurement of process equipment for Sherbourne Resource Park all deliver to a worldwide market and are adopting increased levels of automation, the use of robotics and technology to achieve high quality and to ensure sustainable supply chains for recycled materials. This is the same ethos which underpins the Sherbourne Resource Park business case.

The three bidders are well-established international market players in MRF process equipment:

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<sup>14</sup> <https://resource-recycling.com/recycling/2017/04/20/glass-costing-mrfs-150-million-annually/>

<sup>15</sup> However, Re-Gen recently reconfigured their MRF to collect mixed paper due to increasing cardboard.

<sup>16</sup> WRAP Recovering value from MRs

<sup>17</sup> The Loop patented technology claims to be able to recycle waste plastic an infinite number of times with no degradation in quality.

<sup>18</sup> <https://www.suez.com/en/news/press-releases/loop-industries-and-suez-announce-strategic-partnership-to-build-first-infinite-loop-facility-producing>

- *Machinex/GMI* (Canada) are turnkey technology providers, most commonly known in the UK for operating a single-stream system at UPM Shotton paper mill which handles c.270ktpa of co-mingled collections (paper, cartons, cardboard, plastic film, plastic, glass and metal containers). Technology provider Machinex/GMI are increasing levels of automation within their process including the use of robotics (Samurai) and elliptical movements which are non-wrapping for film, helping to reduce maintenance and downtime.
- *SutCo* (Netherlands). Recent research developments have been focused on 'automatic bunker management operation' for plants that are able to sort packaging waste (PP, PET, HDPE, LDPE), paper, Tetra and aluminium) and determines the best time for emptying the bunker using fill level measurements.
- *Bollegraaf* has extensive experience with large scale MRFs. Within the UK Bollegraaf technologies are applied in Cardiff Council's Lamby Way Depot processing c.53ktpa of MDR.<sup>19</sup> The Sunset Park MRF (North America's largest MRF) operated by Sims Municipal Recycling is equipped with a Bollegraaf processing system.

Further due diligence on the bidders' capabilities have been undertaken as part of the tender dialogue and evaluation process.

## 4 Future challenges for MRF operators

In addition to the current challenges facing MRF operators surrounding material prices, Brexit and Covid-19, there are a number of policy changes on the horizon which MRF operators will have to consider and be prepared for. Some of these changes may present opportunities, i.e. increasing card / transit packaging, whilst others such as Deposit Return Scheme (DRS) and Extended Producer Responsibility (EPR) which will drive material and tonnage change, will require preparedness and ability to adapt. In some cases, these forthcoming policy changes may necessitate contractual changes. An overview of these challenges is discussed below.

### 4.1 Future Policy

One of the main drivers for change is the Resources and Waste Strategy for England, which was released in 2018. "Our Waste, our Resources: A Strategy for England," is focussed on recycling quality and increasing recycling rates, particularly for business waste, and packaging producer responsibility reforms. Figure 2 shows the recycling rate since 2000/1 for Local Authority Collected Waste (LACW) across England.<sup>20</sup> Over the last 4-5 years the recycling rate in England has stagnated at under 45%. The Strategy aims for a 65% recycling rate by 2035, in line with targets set in the EU Circular Economy Package.

<sup>19</sup> <https://www.recyclingwasteworld.co.uk/in-depth-article/still-going-after-all-these-years/148019/>

<sup>20</sup> Defra MSW Statistics 2000/1- 2018/19

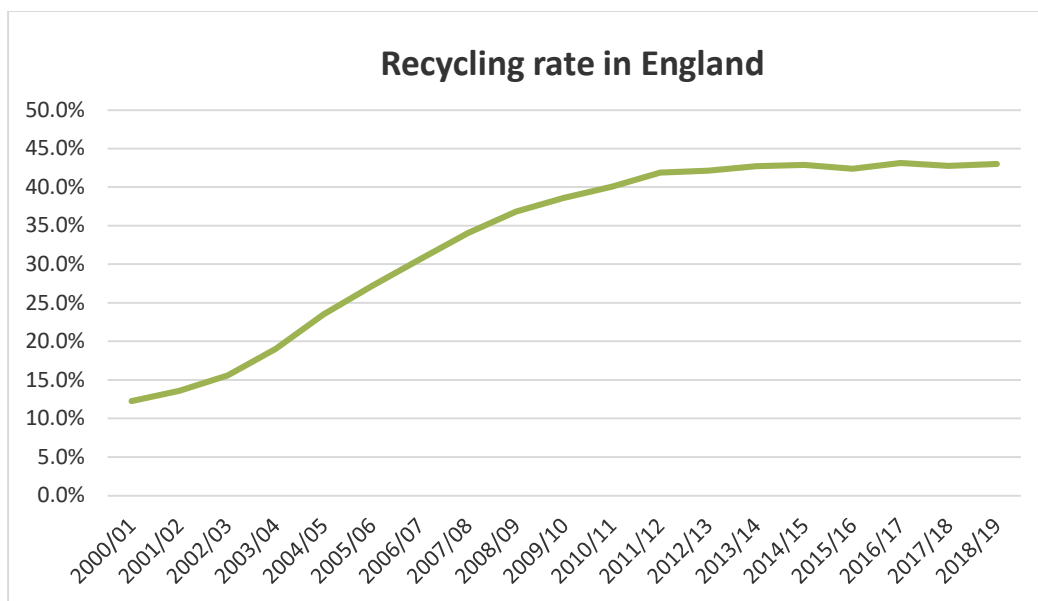


Figure 2: LACW Recycling Rate – England<sup>21</sup>

In a report by Anthesis in 2018<sup>22</sup> looking at the potential capacity and gaps within the English waste infrastructure system from 2020 to 2050, the UK needs between 1.5 and 3.3Mtpa of additional MRF capacity by 2035 if we are to reach the 65% recycling target<sup>23</sup>. However, it is worth noting that this report was written prior to the release of the English Resources and Waste Strategy. The MRF capacity required will depend on a number of variables, including the collection method of key materials.

The proposals set out within the Resource and Waste Strategy align with the commitments set out within the 25-year Environment Plan which include:

- Reforming and extending the producer responsibility system to include products not currently covered and stimulate the secondary plastics sector (Section 4.2.2)
- Encouraging industry to rationalise packaging and materials formats to facilitate end-of-life processing (Section 4.2.2)
- Encouraging development of bio-based, biodegradable and ‘environmentally friendly’ plastic (Section 4.3.3)

#### 4.1 Consistent Collections

Within the Resources and Waste Strategy is the objective to improve the consistency of recycling materials collected by Local Authorities and waste contractors. Subject to consultation, the Government will specify a core set of materials to be collection by all Local Authorities. During The Local Authority Recycling Advisory Committee’s (LARAC) annual conference 2020, Defra confirmed that plastic film was

<sup>21</sup> Defra MSW Statistics 2000/1- 2018/19

<sup>22</sup> Anthesis (2018) National infrastructure assessment: waste infrastructure analysis for England

<sup>23</sup> Report no longer publicly available.

not 'off the table' when considering materials to be included in the consistent collection requirements and so appropriate collection and treatment infrastructure for this stream may be required<sup>24</sup>.

The intention is to lay the regulations governing consistent collections into law by 2022 so that operations can be rolled out in 2023. It is understood that Local Authorities will be able to phase in the requirement for consistent collection from 2023 (i.e. in line with contract dates, renewal of fleets etc.).

The strategy proposes the collection of a core set of dry recyclable materials at the kerbside from houses and flats (glass bottles and containers, paper and card, plastic bottles, plastic pots tubs and trays and steel and aluminium tins and cans) unless an exemption or TEEP applies<sup>25</sup>. Subject to the next round of consultation<sup>26</sup> it is expected that collections will also need to include cartons, aerosols, foil and plastic packaging including film. The aim of the proposals is to incentivise quantity and quality of material collected to achieve higher recycling levels, and to address householder confusion. However, it is proposed that how local authorities collect the material would be determined at a local level. Defra is due to publish new TEEP guidance for Local Authorities around the specification for material consistent collection. From a MRF perspective, the consistent collection scheme should help to reduce contamination, with more consistency and clarity on what materials can go into a mixed dry recycling collection, which could mean that there is less reliance on pre-picking of contamination. There is the risk, however, that the revised guidance strongly advocates twin stream or kerbside sort, perhaps through setting of the economic threshold within the TEEP assessment, irrespective of the quality of materials that can be achieved through a modern, high-performance MRF. This could render the MRF redundant.

#### 4.1.1 Kerbside dry recycling collection schemes

The number of co-mingled dry recycling waste collection schemes provided in the UK has steadily increased over the last 10 years, as shown in Figure 3. As of last year (2019/20), almost half of the kerbside dry recycling collection schemes were co-mingled. Twin-stream collections have also steadily increased over the last 10 years. In 2010/11, c.19% of the dry collection systems were of a twin-stream configuration compared to c.34% last year. Conversely, the number of kerbside sort systems has decreased, now only c.17% of collections are kerbside sort systems compared to 39% in 2010/11.

One of the main factors which has potentially resulted in a decrease in the number of multi stream schemes is due to austerity and the need to reduce waste collection costs. North Warwickshire BC has recently (2019) replaced its twin-stream service with a co-mingled service as it was estimated a saving of c.£75,000/annum could be achieved<sup>27</sup>.

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<sup>24</sup> The second round of consultations on this issue are due in the early 2021, and the outcome of these consultations will provide a steer on the fate of waste plastic film in England

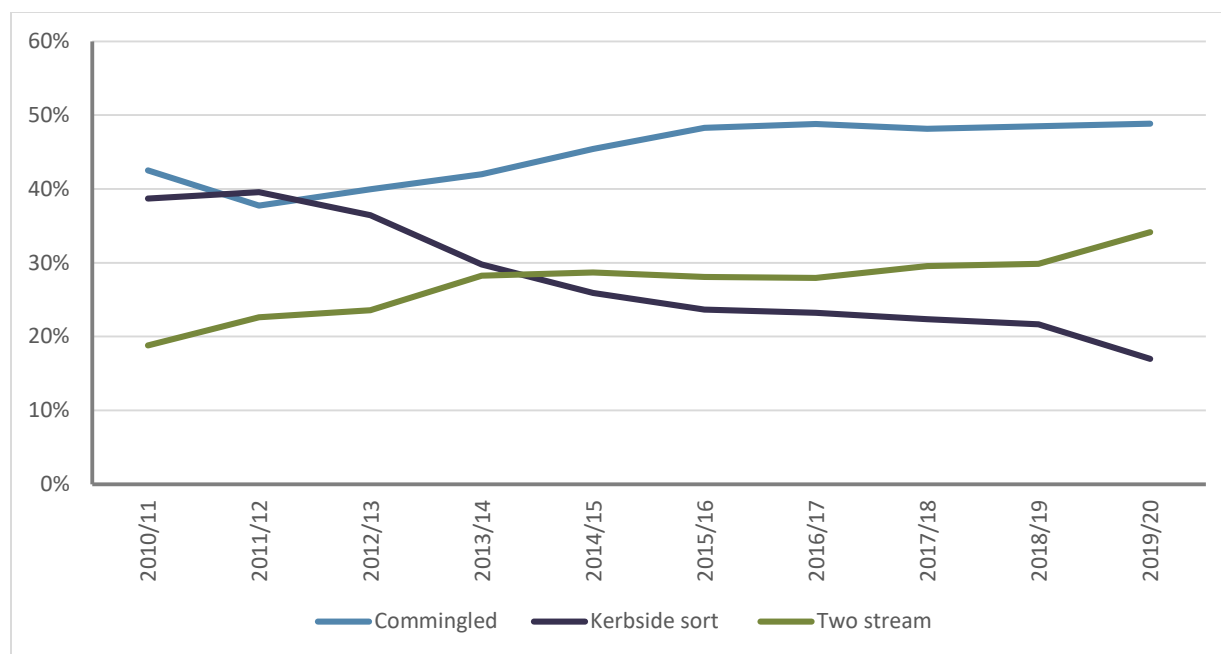
<sup>25</sup> Exemptions from separate collection i.e. where not practicable for technical or economic reasons or no significant environment benefit (TEEP) or where co-collection does not significantly reduce the potential for the waste stream to be recycled.

<sup>26</sup> Expected in Spring 2021

<sup>27</sup> <https://www.letsrecycle.com/news/latest-news/north-warwickshire-opts-to-end-twin-stream-recycling/>



Figure 3: Kerbside dry recycling collection configuration since 2010/11<sup>28</sup>



Looking ahead and following the trend of the last few years, it is likely that Local Authorities will be considering moving towards a simplified dry recycling collection configuration. Last year Biffa recommended a collection model for households of co-mingled recycling (plastics, metals and glass) alongside a separate paper and card stream<sup>29</sup>. With regards to the twin-stream services, bags and wheeled bins are preferred over plastic inserts due to the cost of replacement. With forthcoming policy drivers, the expected quality standards, twin-stream services can be considered to be a compromise position between simplicity, cost and ensuring a high level of quality. Newcastle-Under-Lyme Borough Council (NULBC) is one of the most recent Local Authorities to move from a kerbside sort system to a twin-stream service. Due to the pressures of the Covid-19 pandemic earlier this year (2020) NULBC operated a fully co-mingled service to increase the efficiency and safety of the collections both for the crew and residents. Following this change in configuration, NULBC decided to bring forward the roll out of the twin-stream service to July 2020 which was originally scheduled for September.

Not only are Local Authorities looking at changing the configuration of their dry recycling service, the types of waste collected for recycling at the kerbside is also increasing. A growing number of Local Authorities are now collecting plastic pots, tubs and trays (PTT) at the kerbside alongside small electrical equipment and batteries. In addition, the Resources and Waste Strategy<sup>30</sup> aims to legislate that all households and appropriate businesses have a separate weekly food waste collection<sup>31</sup>. With an increase in the number of kerbside services, it may be that Local Authorities turn to a co-mingled

<sup>28</sup> WRAP LA portal

<sup>29</sup> <https://www.letsrecycle.com/news/latest-news/biffa-backs-twin-stream-recycling-collection-system/>

<sup>30</sup> As also set out in the Environment Bill.

<sup>31</sup> In Scotland, businesses producing over 5kg per week of food waste are required to have a separate commercial collection of food waste.

collection to achieve cost savings. In which case, plants such as the Sherbourne Resource Park will be required to handle this material.

Speaking at this year's MRF and Markets conference (hosted virtually by LARAC and Lets Recycling), glass reprocessor Recresco suggested that co-mingled glass was the preferred method of collection for the company. Whilst glass is often broken, Recresco technology is confident that its plants are able to sort it with good enough quality and that the overall increase in glass that is achieved through a co-mingled scheme is worth it.

## 4.2 Deposit Return Scheme & Extended Producer Responsibility

Also within the Resources and Waste Strategy, the Government has confirmed that it will introduce a Deposit Return Scheme (DRS) and an extended producer responsibility (EPR) scheme for packaging by 2023. Introducing these policy measures will likely have an impact on the composition and tonnage of material collected at the kerbside by Local Authorities, and consequently the material processed at a facility.

### 4.2.1 DRS

A DRS aims to improve overall recycling and resource recovery by placing a redeemable deposit on 'in scope' packaging. DRS has been implemented widely across Europe and is generally well received as part of a total waste management solution with Scandinavia and Germany reporting return rates of up to 95% of target packaging. From a MRF perspective, DRS has the potential to remove the higher value materials from the incoming DMR, targeting specifically PET plastics. Depending on the scale of the scheme, there will also be less steel to magnet off, less aluminium to capture through the eddy current separation and significant reductions in glass tonnages. Re-Gen, which operates a state-of-the-art MRF in Newry, Northern Ireland is predicting 25% reduction in weight input as a result of the DRS introduction and £15-20/tonne value reduction on basket value<sup>32</sup>. It may also be that significant changes in the composition of material arriving at MRFs will necessitate contract changes and/or reconfigurations at facilities. For this reason, some within the industry have called for the government to follow an 'on-the-go' scheme which focuses on packaging consumed outside of the home (e.g. water bottles), as this would have less of an impact on the types of materials MRFs are used to handling. However, this could provide an incentive to expand the breadth of materials collected and treated at facilities, including PTT, plastic film etc.

In Scotland, where the system is due to be implemented before England, the anticipated DRS administrator is exploring whether the industry and existing infrastructure can be used for counting and sorting material. However, this may be constrained by the existing facilities and complexities (such as ownership of unredeemed deposits) which would need to be bottomed out by Government. Following the situation in Scotland will provide key lessons for the Sherbourne Resource Park.

FRM has modelled the implications of EPR and DRS for a number of Local Authorities using the 'Resource and Waste Policy Impact Calculator' (RAWPIC)<sup>33</sup>. For the purposes of modelling, FRM assumed that the DRS system implemented for England will mirror the proposed DRS system for Scotland which is set to be implemented in 2022. This DRS model is classed as an 'all in' system which applies a 20p deposit on plastic, glass and metal beverage containers. This includes multipacks and items up to 3L in

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<sup>32</sup> LARAC MRF & Markets Conference (2020) Re-Gen

<sup>33</sup> This is a product developed by Suez and Anthesis with support from LARAC and Kent Waste Partnership

size but excludes dairy products. Working on the general assumption that the DRS will return a capture rate of approximately 85%, Table 1 shows the potential impacts on targeted material streams.

#### 4.2.2 Extended Producer Responsibility

Reforming the UK packaging producer responsibility system aims to achieve better design of packaging (e.g. through increasing recycled material content or improving recyclability of packaging products). At present, it is understood that household packaging will be included within the EPR scheme and Defra is consulting on whether other household-like waste streams should also be considered. Under EPR, producers will be responsible for the sorting costs of their packaging. As such, modulated fees on EPR for packaging aims to drive up recyclable materials (as producers change packaging to minimise the cost of recycling that packaging) and squeeze out of the market materials which are complex or unable to be recycled (e.g. composites such as Pringles' notorious packaging and avoid it being disposed of as residual waste). For example, we should see a continued move away from black trays which MRFs cannot detect. It is therefore assumed that more packaging items are able to be recycled and diverted from the residual waste stream.

Under EPR, producers will be responsible for covering the cost of treating the packaging placed on market, so where MRFs are involved, this needs to be identified and reported appropriately. According to the Environmental Services Association<sup>34</sup>, there are three options for this arrangement:

- 1) The EPR scheme pays the council the lump sum for collecting and sorting, and then used to enter into an agreement with the MRF
- 2) A central body pays the MRF direct
- 3) Producer compliance scheme contracts a MRF on behalf of producer clients

Packaging coming into MRFs is going to change as a result of DRS and EPR. Under EPR it is likely that over time there will be less composites in general, fewer and more consistent material streams (i.e. an increase in PET, PP packaging). However, DRS might take out a lot of the value. It will be important for the Sherbourne Resource Park to monitor the implementation of these schemes.

As producers will be responsible for covering the treatment cost of the packaging they place on the market, from a MRF perspective more stringent reporting requirements on input and output and identifying the proportion of packaging that is 'in scope' will be required so that they can be identified and allocated back to the customer. As it is likely that DRS and EPR will be rolled out over similar time frames, the Government will need to make sure that producers do not double pay under the two schemes, i.e. in the case that DRS materials from the kerbside scheme arrive at MRFs the DRS administrator could pay the EPR scheme administrator to compensate them for picking up the material (as through EPR, producers will be responsible for covering this cost)<sup>35</sup>. However, it is unclear at present how this would translate to the MRF and Councils, although it is suggested that more sampling and reporting mechanisms may be required. For example, it is important to consider that glass beverage containers that are included in DRS may become broken at MRFs (as it does through kerbside collection) and so payment mechanisms need to take this into consideration, it may be that it is paid for by tonnes processed rather than per unit.

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<sup>34</sup> LARAC MRF & Markets Conference (2020) ESA presentation

<sup>35</sup> There are ongoing discussions around the payment mechanisms that will be required to manage DRS and EPR.

Both DRS and EPR are scheduled to be implemented in 2023, however it is generally assumed that DRS will have a bigger and quicker impact than EPR on kerbside collections, and therefore the ability for MRFs to adapt to changing material streams will be imperative. The view from the Environmental Services Association is that the deadlines for these policy measures seem quite tight, exacerbated by impacts from Covid. Although the industry’s response to Covid-19 has demonstrated how flexible and adaptable it can be.

As modelled using the Resource and Waste Policy Impact Calculator (Developed by Suez and Anthesis), Table 1 shows how EPR and DRS may impact the kerbside recycling arisings based on Local Authorities FRM has supported in recent years.

Table 1: Tonnage impacts of DRS and EPR

Local Authority	DRS Impact Range	EPR Impact Range
Total Recycling change	-12 to -16%	
<i>Paper % Card</i>	0%	
<i>Targeted plastic</i>	-15% to -30%	+0% to +12% (PTT / Other Dense)
<i>Glass bottles</i>	-52% to -55%	
<i>Metals</i>	-8% to -12%	+0% to +14% (steel cans)
Residual	-2 to -3%	

### 4.3 Plastics policies

Over the last couple of years, the English Government has introduced and, in some cases, is consulting on a number of policies aimed at reducing plastic waste in line with the strategic ambition to work towards all plastic packaging placed on the market being recyclable, reusable or compostable by 2025 and to achieve the target of eliminating avoidable plastic waste by the end of 2042, which is outlined within the Government’s 25-year Environment Plan<sup>36</sup>. In addition, the following policies/initiatives have supported the reduction of plastic waste in the UK which demonstrate the strength of the focus on this material:

- Ban on plastic straws, stirrers, and cotton buds which came into force in England in October 2020.
- Plastic carrier bag levy. The levy was first introduced in 2015 with a minimum charge of 5p per bag. The government announced in September 2020 that from 2021 the plastic bag levy will be doubled to a minimum of 10p and smaller retailers (those employing 250 people or less) will no longer be exempt.
- Microplastics ban. A ban on the sale of products containing microbeads came into force in 2018.

The plastic policy direction at both a national and European level is to reduce the amount of plastic waste entering the system through the introduction of single use product bans. The focus is also directed at redesigning plastic products to ensure a high percentage of the plastic content is either recyclable or compostable in line with moving towards a more circular economy.

<sup>36</sup> A Green Future: our 25-year plan to improve the environment, HM Government, 2018

The introduction of these policies is already having an impact amongst the packaging industry; driving the incentive and putting pressure on plastics and flexibles to be collected. Producers are responding with the introduction of products with recycled content such as Ribena and Mars Incorporated<sup>37</sup>. As such, MRF operators will be faced with changing material inputs, including increased packaging with recycled content, alternative material components and light-weighting, as discussed in turn below.

Ribena has announced that from January 2021 its bottle design will be changed to increase recyclability. Previously the dark sleeve on the bottle and its size could stop sensors detecting the bottle, however the new bottle has been designed with a smaller sleeve and will be made from 100% recycled content<sup>38</sup>.

#### 4.3.1 Plastics tax on recycled content

From April 2022, a new tax will apply to any plastic packaging produced in or imported into the UK that does not contain at least 30% recycled plastic. This will apply to any packaging that is predominantly plastic by weight. There will be an exemption for producers and importers of small amounts of plastic packaging to mitigate against disproportionate administrative burdens in comparison to the tax liability. However, this tax will apply to all packaging, regardless of whether it is filled or not.

This is supported by other policy and voluntary measures for supporting a reduction in single use plastic, including the UK Plastic Pact. Plastics has become a high-profile material. Some brands are reacting to this by committing to eliminate 'pointless plastic' and are switching to non-plastic packaging. As an example, Molson Coors (UK and Ireland) committed to removing the plastic film wrap from multipack items by March this year and by March 2021 will remove the plastic rings from its Carling and Coors Light branded items, switching these out for cardboard sleeves<sup>39</sup>. This could lead to increases on other material streams such as card or glass. However, further research is required to understand the full life cycle cost of plastic packaging and other material substitutes and as such the environmental burden of these options.

As the output streams from MRFs adjust for an increase in recycled plastic content, it may be that facilities need to provide more back end sorting and investment for example, if materials are intended for food, they will need to be sorted into food grade standards.

As packaging producers work to raise the recycled content of their packaging, this in turn creates a demand for reprocessing capacity, and there has been an increasing number of investments in plastic recycling facilities as a result (e.g. plastics recycling facility being developed by Suez in Avonmouth). And earlier this year Viridor signed a contract to provide recycled plastics to a chemical recycling plant being developed by Plastic Energy<sup>40</sup>. This trend has also been supported by Government when, at the beginning of October 2020, the UK Research and Innovation (UKRI), with matched investment from industry, announced a first round of £20million research funding to develop four UK plastic focused projects. Applications were submitted to UKRI in late 2019, and form part of UKRI's Smart Sustainable Plastic Packaging (SSPP) challenge to increase the amount of recyclable plastic packaging and reduce

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<sup>37</sup> <https://www.circularonline.co.uk/news/mars-to-include-recycled-plastic-in-pet-food-packaging/>

<sup>38</sup> <https://www.packagingnews.co.uk/news/materials/labelling/ribena-announces-new-bottle-designs-boost-recycling-11-11-2020>

<sup>39</sup> <https://www.packagingnews.co.uk/news/environment/brewer-remove-plastic-carling-coors-light-brands-15-08-2019>

<sup>40</sup> <https://www.viridor.co.uk/who-we-are/latest-news/2020-news/viridor-plastic-energy-circular-economy/>

plastic waste leakage into the environment. The range of options for post sorting and chemical recycling of plastics grades are growth areas as the UK seeks to derive more resource value from the complex mix of plastics on the market.

#### 4.3.2 Light weighting of materials

MRFs across Europe and America have been seeing the impacts of packaging light-weighting over the last few years, and with rising concerns over the environmental impact of plastic this trend is likely to continue. In addition to reducing the environmental burden of packaging, reducing material weights and modify packaging formats also has a strong business case as it often leads to a production cost reduction and efficiencies with transportation.

Nestle has reduced the weight of its water bottles by 22% over the last decade. Through technological advances, packaging providers are able to improve product durability (i.e. through injection compression technology to retain quality whilst driving down raw material use<sup>41</sup>. Unilever has also committed to halving its use of virgin plastic and using at least 25% recycled plastic by 2025. Innovations by Unilever include replacing plastic in ice cream tubs with recyclable paper-based materials<sup>42</sup>.

One of Diageo's four sustainable packaging targets is to reduce packaging weight by 15% by 2020, alongside commitments to increase recycled content to 45% and make 100% of packaging recyclable or reusable<sup>43</sup>. The company has managed to reduce the weight of its Smirnoff glass bottles by 137g. Scaled up to the 8.7 million bottles sold, this is a significant saving<sup>44</sup>.

Light-weighting of packaging, particularly plastics, can create difficulties in mechanical sorting and separation processes, resulting in lower quality MRF outputs or reduced sorting capacity. Laminated pouches, in particular (i.e. pet food, baby food, drinks etc), have led to bespoke alternative collection systems through Terracycle to facilitate separate treatment by pyrolysis. EPR will need to take account of full life cycle costs, so the marginal sorting costs irrespective of the weight will need to be considered.

#### 4.3.3 Composition changes

Developing new materials as alternatives to plastics has also seen a growing trend over the last few years. Alternative materials have ranged from switching out plastic for conventional materials such as paper and glass to using organic compounds including fungus, seaweed, shells and plant-based material.

In reaction to the increasing negative publicity of plastics, manufacturers and businesses have been looking at alternative materials, including compostable and biodegradable plastics. However, contamination of bioplastic-based products presents a significant and increasing challenge from a collection, separation and treatment standpoint.

Firstly, there is a contamination issue for conventional plastic streams if the bioplastic materials are collected with other recyclates by mistake. And secondly, there is a challenge to maintain and improve compost quality where bioplastic products are collected with organic waste and do not decompose

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<sup>41</sup> <https://www.nestle.com/ask-nestle/environment/answers/tackling-packaging-waste-plastic-bottles>

<sup>42</sup> <https://www.unilever.com/news/press-releases/2020/unilever-makes-progress-on-its-sustainable-packaging-goals.html>

<sup>43</sup> <https://www.diageo.com/en/in-society/pioneer-grain-to-glass-sustainability/reducing-our-environmental-impact/sustainable-packaging/>

<sup>44</sup> <https://www.diageo.com/en/in-society/case-studies/reducing-packaging-weight-we-can-handle-it/>

properly. There could be a significant impact on the integrity and composition of conventional recycled plastics if bioplastics cannot be adequately segregated. Therefore, proper separation and sorting and collecting of waste is imperative, alongside consistent communication on proper disposal routes for compostable/biodegradable products.

#### 4.4 Labelling

Labelling packaging is key to ensure that consumers can correctly sort and separate recycling from their residual bins. To help drive change ahead of the EPR reforms, the not-for-profit On-Pack Recycling Label (OPRL) has announced new rules for its packaging label scheme. OPRL's aim is to provide UK-wide, consistent recycling messages for its retail and brand producer members packaging. Their two main labels signify whether an item can be recycled or not with a simple 'Recycle'<sup>45</sup> or 'Don't Recycle'<sup>46</sup> label. This should help to improve the quality of materials received at the MRF. In addition to labelling, the organisation has also announced a 'certified as recyclable' scheme which provides assurance that the packaging type and materials is collected and effectively sorted for recycling at MRFs and Plastics Recycling Facilities (PRFs) across the UK, with active markets for reprocessing the materials into new products.

##### *Sherbourne Resource Park approach*

One of the main challenges facing any MRF over the next few years is the potential risk associated with reduced feedstock – this could be due to a variety of reasons, but the implications from the introduction of a DRS could be significant on the quantity of recyclable material presented by householders at the kerbside, and thus directed as feedstock to the Sherbourne Recovery Park facility. While the effects on kerbside tonnage are likely to be tempered to a certain degree by the positive impacts of EPR for packaging materials, each of the Partner Councils are expecting to see a reduction in dry recyclables collected. It is understood that AssetCo will also be taking this in account in their business planning. While recognising the risk to the project in terms of reduced quantities of feedstock direct from Partner Councils, the project also recognises the opportunity for processing bulked material collected through DRS. The collected DRS material will need to be sorted somewhere, and the Partner Councils could place themselves in a positive position to provide a service to collect / bulk the DRS material from collection points or transfer stations. As mentioned in Section 2.1 the flexibility and additional space within the Sherbourne Resource Park could mean that it would be well placed to adapt and also to accommodate tracking technology.

The project is anticipated to benefit from the additional tonnage of recyclable waste likely to emerge through the EPR scheme, although this is could be more than offset by reductions due to DRS. The operation of the facility will also be set up to deliver the stringent reporting requirements anticipated with the EPR reforms.

The MRF is primarily designed to deal with fully co-mingled recyclate, at a time when national waste strategy is championing separate collection in some contexts. Each of the Partner Councils has undertaken a TEEP assessment to support its chosen method of recyclate collection. The Sherbourne

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<sup>45</sup> "Whereby 75% or more of UK local authorities collect that type of packaging which is then effectively sorted, processed and sold as recyclate for use in new packaging or products." Source: OPRL

<sup>46</sup> "Whereby fewer than 50% of UK local authorities collect that type of packaging and/or it is not effectively sorted, processed or sold as recyclate for use in new packaging or products." Source: OPRL

facility does have flexibility to deal with some separately collected material streams (i.e. paper, card and glass), although the fundamental premise is to achieve high quality recyclables through the use of technology.

The flexibility to adapt the process configuration to target different materials through the use of technology will allow the facility to respond to changing feedstock composition going forwards. The facility is designed to have the ability to separate all types of plastics, including the more difficult types resulting from the light-weighting of plastic packaging (pots, trays, tubs and film). The introduction of a plastics tax is already having an impact. Major bottle beverage providers have made strong commitments to recycled plastic content which will drive demand for high quality recycled plastic. This demand will shape prices and could be a good opportunity for the Sherbourne facility if it is able to recover good PET to supply high quality plastic recycle to the reprocessing industry.

#### 4.5 Other considerations

The adaptability to changing material inputs is the primary challenge for MRFs, with increased automation and technology developments. However, other issues for consideration include the impacts associated with Covid and Brexit, where the extent of the implications going forward are difficult to quantify.

##### 4.5.1 Covid impacts

In the initial weeks of lockdown, many industries (which were unable to work remotely) were forced to close. This created significant initial disruption within the waste industry particularly on C&I and C&D waste streams. From a municipal waste management perspective, Local Authorities had to move quickly in order to adapt service delivery and ensure continuity. For MRFs, this meant an initial increase in mixed recycling and recyclates being processed predominantly fed by kerbside collections.

Data collected by ADEPT across the period March to September 2020 showed that the majority of Local Authorities exhibited an increase in arisings (even at the end of the survey period) of between +1 and +20%, and in other Councils this is even higher. The last report was early September when 77% of Local Authorities surveyed saw an increase in residual waste, with the figure being slightly higher for Local Authorities experiencing an increase in recycling tonnage.

As reported by Suez, by mid-April waste contractors were seeing peaks in tin/cans and glass and a generally larger volume of mixed recycling, as a result of unstocking material from home and the majority of people being in lockdown. By mid-May, there were higher peaks in plastics and glass. It is assumed this is driven by a change in behaviour in the home and in turn, purchasing behaviours. By June, materials started moving back to normal in terms of composition, although were generally higher in tonnage. In comparison to previous years, Suez<sup>47</sup> reported increases of between 9.3% within the first month of lockdown (compared to the same month in 2019), peaking at 54% increase (from the previous year) in June 2020.

Taking paper and card as an example, pre-Covid-19, paper and card was in an oversupply market and as such prices were very low. But during the initial lockdown, C&I sources of fibre shut almost overnight. Italy, Spain, Germany (UK export markets) quickly became very short of packaging, driving up demand and as such, prices. During the summer a substantial quantity of paper was leaving the country as

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<sup>47</sup> LARAC MRF & Markets Conference (2020) Suez presentation



overseas markets were desperate for material to manufacture new packaging. However, collections from commercial and industrial sources were still majorly disrupted. From a MRF perspective, the composition of paper and card is changing, with board and card becoming more present in MRF streams (the 'Amazon effect'). This was no exception during Covid-19 and is likely to remain the case as working from home continues to some degree. With Covid-19, the demand of newsprint may not recover, e.g. free print papers issued on public transport. MRFs have been adapting to the declining paper markets, including Re-Gen which actively changed from operating a separate news & pams line, and now a mixed paper grade is processed including card.

In respect to long-term impacts, although there is uncertainty over how long the immediate impacts of Covid-19 will last (lockdown), MRFs may expect kerbside recycling tonnages to remain high whilst home-working increases beyond lockdowns as our ability to deliver work remotely continues. This will also bring about new and changing compositions. For example, the way we live at home is different (i.e. lunches are not 'on the go'), and packaging is usually for multiple items rather than single use.

This may also lead to prolonged decreases in commercial waste and impact MRFs processing dry mixed recycle from the private sector. From a commercial waste perspective, Suez has reported a 20-25% reduction in paper and card, 25-35% reduction in glass, 20-30% reduction in metals and 20-25% reduction in plastic.

Operationally, MRFs may be required to adhere to social distancing over the medium to long term, which may require slower belt speeds to reflect lower manual sorting capacity. The use of robotics and an increase in process automation will be advantageous here too, helping to reduce the reliance on manual labour.

#### 4.5.2 Brexit

Recycled market prices may be adversely affected by Brexit, depending on the shape of trade agreements. Longer term positive effects on the recycling market could be delivered through increased reprocessing capacity in the UK. Brexit also could have an impact on capital costs for MRF equipment, depending on import tariffs from Europe.

As with many sectors, the waste industry will be monitoring the situation with Brexit for any issues with labour and disruption to supply chains.

## 5 Summary

Over the short-term material prices are likely to be impacted by the uncertainties of Covid-19 and Brexit. Policy instruments aimed at improving quality of recycling, as driven by the push for a more circular economy, are likely to have an impact on pricing over the longer term.

Markets for MRF outputs could squeeze and will change as competition drives higher quality through stricter international standards and measures for collection of material as through a DRS and/or a kerbside sort collection service. However, this could present an opportunity for the Sherbourne Resource Park. The collected DRS material will need to be sorted somewhere, and the Partner Councils could place themselves in a positive position to provide a service to collect / bulk the DRS material from collection points or transfer stations.

As Local Authorities seek to make efficiencies and cost savings, and separation technology improves, it may be that we see co-mingled streams continue on the current trend of increase, subject to new guidance on consistent collections. The Partner Councils will need to determine and confirm their positions with regards to TEEP, which could be seen as a significant risk to the MRF infrastructure. However, with incoming DRS and EPR implementation, we are likely to see significant changes in composition. During this period of transition, plants will need to be adaptable to change and, in many cases, may need reconfiguring to meet feedstock challenges and market requirements. MRF operators will have important decisions to make on changing materials, for example accepting plastic film, where food contaminated packaging poses a risk at MRFs and for reprocessors. Robust reporting will also need to be employed to support the EPR reforms.

The flexibility to adapt the process configuration to target different materials through the use of technology will allow the facility to respond to changing feedstock composition going forwards. The facility is designed to have the ability to separate all types of plastics, including the more difficult types resulting from the light-weighting of plastic packaging (pots, trays, tubs and film). The introduction of a plastics tax will be an opportunity for the Sherbourne facility to supply high quality plastic recycle to the reprocessing industry.

The Sherbourne Resource Park is designed to focus on producing quality recyclable materials to reduce the risk associated with market availability and price. The MRF equipment being procured is highly automated and will incorporate the latest technological advances. The three bidders remaining in the procurement of process equipment for Sherbourne Resource Park all deliver to a worldwide market and are adopting increased levels of automation, the use of robotics and technology to achieve high quality and to ensure sustainable supply chains for recycled materials. This is the same ethos which underpins the Sherbourne Resource Park business case.

Frith Resource Management Ltd, November 2020