



## APPENDIX 3 - An investigation into the drivers and barriers relating to the adoption of refillable packaging

WR0113: Objective 2

Deliverable for DEFRA Waste and Resources Evidence Programme

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## 1 Background to project

In recent years the environmental impact of packaging has become a prominent issue in the UK as it is a very visible product in the waste stream, making up around one-third of household rubbish (LRRRA, 1996). In 2005, the global consumer packaging market was estimated to be worth around US\$370 billion with growth expected at around 5% per annum in the near future. Mature markets, for example North America and Western Europe, show moderate year-on-year increases, while developing markets feature above average growth trends. Food and beverage packaging are the two largest segments, accounting for more than two-thirds of the total. Beauty and healthcare markets each account for around 5% (Rexam, 2005). Refillable packaging has been around for a very long time, in 1979 81% of beer in the EU was sold in refillable bottles, this fell to 60% in 1997 (Platt and Rowe, 2002). Over the past few years in particular, there has been a shift from using refillable packs to using recyclable containers in metal, plastic and glass (Rexam, 2005).

The introduction of the European Packaging and Packaging Waste Directive in 1994, which requires Member States to ensure that all packaging placed on the EU market complies with certain 'essential requirements' has made packaging a more important issue for consideration in many businesses. Over the past 40 years considerable efforts have been made to reduce the environmental impacts of packaging by focusing on issues such as light-weighting and material selection (Lewis et al., 2001; Holdway et al., 2002). However, although these redesign approaches are commendable and should be encouraged, they are not having a radical effect on the impact of packaging. Whilst the weight of packaging per unit of product has decreased, demographic and lifestyle changes such as smaller family size and a demand for greater convenience (INCPEN, 2001) have led to increases in the total amount of packaging used. A key report by the Environmental Services Association (Environmental Services Association, 2004) identified that in 2003, the total packaging waste going to landfill in the UK rose to over 10 million tonnes per annum.

The use of refillable packaging has long been cited as a possible solution to this problem, however in the past, attempts to extend the use of refillables beyond a few traditional areas have met with little success and as of mid 2003 no major retailers in the UK operated any schemes in the reuse of primary packaging (Darlow, 2003). In light of this, the project which this report refers to 'Refillable Packaging Systems' (DEFRA WR0113) set out to develop refillable packaging systems using a product service system approach, and to investigate their feasibility within the personal care market.

## 2 Preceding documents

This report builds on the findings reported in the preceding document:

- **Lofthouse V A and Bhamra T** (2009) *APPENDIX 2: An investigation into consumer perceptions of refills and refillable packaging*, WR0113: Objective 1, Loughborough University, 18<sup>th</sup> September 2009. pp1-34.

### **3 Report focus**

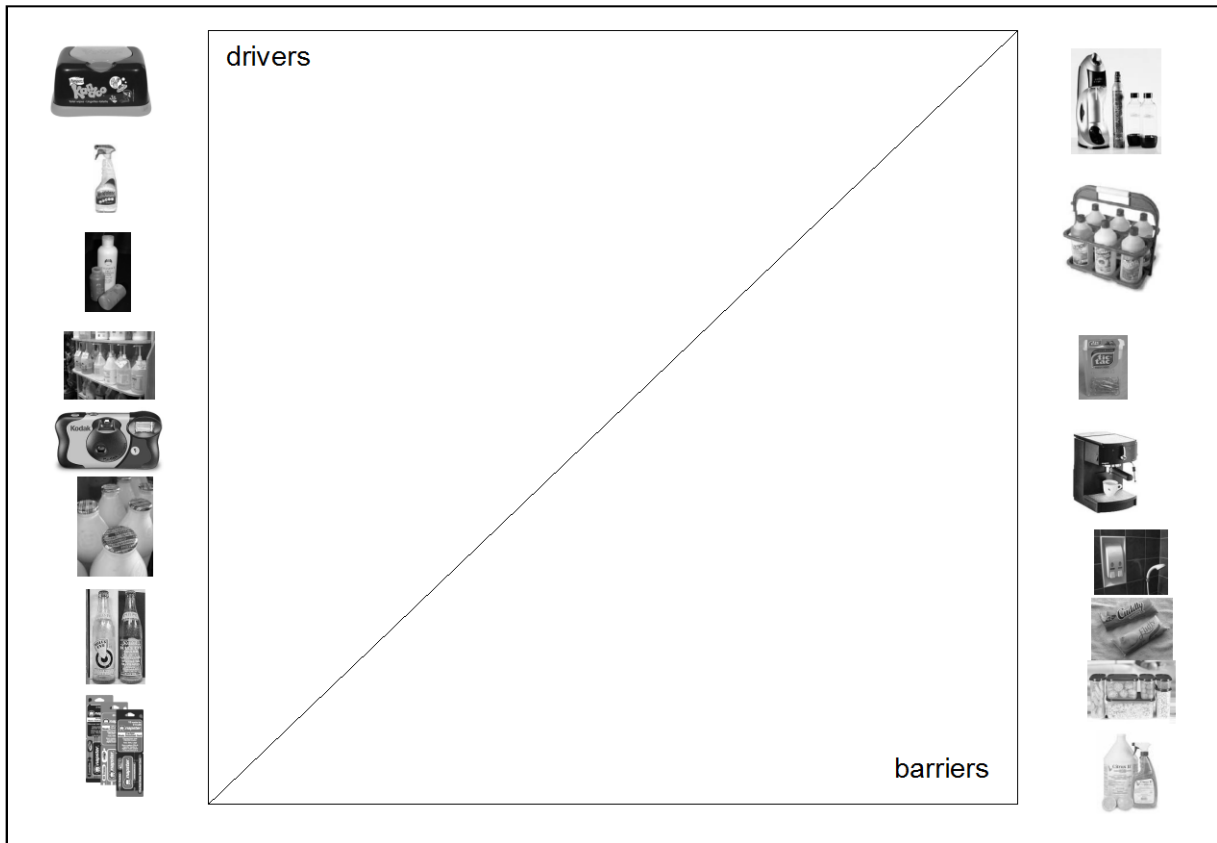
The second objective of the 'Refillable Packaging Systems' project, and the focus for this report, was 'To identify organisational, cultural and other barriers to the adoption of refillable packaging'. In the early stages of this work it was recognised that it would be more valuable to investigate the drivers as well as the barriers to refillable packaging, so consequently the scope of the project was extended accordingly. The extended aim therefore was to build up a picture of the types of drivers which can lead to successful refillable packaging systems and to identify the types of barriers which can lead to failure. The aim of this report is to enable the research team to narrow down their selection of suitable refill types to be investigated as part of this project. This report introduces the methodology used to investigate this objective, and presents the key findings of the work.

### **4 Methodology**

An initial literature survey into refills and refillable packaging, which drew on academic journals, trade press and internet sources, identified little literature that investigates or even mentions drivers and barriers to refills.

In light of this the team selected to utilise the output of the classification exercise outlined in 'Appendix 2: An investigation into consumer perceptions of refills and refillable packaging' to create a visual template through which associated drivers and barriers could be investigated. The classification exercise involved categorising refillable packaging with respect to their delivery mechanism and the level and nature of their consumer/business interaction. Following this activity, the 16 different approaches were analysed to identify potential organisational and sustainability drivers as well as potential organisational and sustainability barriers. Visual templates had been used in previous projects to great success (Lofthouse et al., 2005).

In a focused 'Drivers and Barriers' workshop (held at Boots head office) with Boots personnel from Packaging & Environmental Compliance and Product Bank (the future forecasting arm of Boots), a large visual template was used to facilitate a conversation about the different drivers and barriers associated with each of the 16 categories. Figure 1 shows an electronic representation of the template used. Though it was anticipated that the team would use the sections to record different drivers and barriers associated with refills, they actually ended up drawing lines between the 'issue' identified and the different refills they related to.



**Figure 1 Electronic representation of the template used in the ‘Drivers and Barriers’ workshop at Boots**

The resulting data was analysed and is reported here, in conjunction with the findings from the literature survey and observations from retail outlets.

## 5 Refills

A report by the Scottish Institute of Sustainable Technology into the perceptions of retail supply chains identified four specific factors as to why it was felt reuse of this nature would not work in the UK, on a large scale:

- Health & Safety and Hygiene Regulations,
- the logistical complexities of a multidirectional supply chain,
- price of new packaging; and
- customer behaviour (Darlow, 2003).

Although these insights are useful, they tend to sweep across all types of refills. This report aimed to move beyond this and develop a better understanding of the specific drivers and barriers related to the 16 different types of refills which have been identified. The following section outlines these refill types and illustrates their specific drivers and barriers.

## **5.1 *Lightweight Self Contained Refill Delivered Through Dispenser***



Customer buys a self contained refill which they take home and put into their durable dispenser. Applications include wipes, face creams, razors, cosmetics, fabric conditioner and air fresheners.

### **5.1.1 Drivers**

Selling products as lightweight, self contained refills delivered through a dispenser, is a widely adopted approach which has been adapted to many different markets. There are a number of drivers for this type of approach. From a business perspective this approach encourages high levels of customer loyalty as the dispenser is often considered to be of high quality and/or highly desirable which encourages customers to refill it. In addition, customer loyalty can be encouraged by ensuring that only the refills sold by the manufacturer of the dispenser will fit in it. Refills often have higher profit margins than the original dispenser and large cost savings can be made on the refills if they are designed to use minimal materials. This type of refill also offers easier and cheaper transportation as the packaging is lighter, easier to pack and more can be packed per outer case.

From a sustainability perspective the main drivers for this approach centre around the potential to minimise packaging for the refills, this reduces material use and therefore reduces resource depletion. The lighter weight refill also reduces the environmental impact of distribution as less energy is required to transport the product. In addition less material will end up in landfill when the refill is disposed of.

### **5.1.2 Barriers**

The wide spread application of this type of refill suggests that there are few organisational barriers to this approach. However, there are still a few negative issues which need to be managed. For example, it is often possible for these types of refill to be used without the parent pack, which means that the customer lock-in and brand loyalty that the refill was designed to create is lost. In addition competitors may develop similar lower priced products which also fit the 'parent' pack, unless the original design is novel enough to be protected via a patent. This approach also leads to an increase in stock keeping units (SKUs) as two products are required rather than one. Other costs occur around the need for two manufacturing systems, one for the parent pack and for the refill.

When considering sustainability it is important to note that dispensers (parent packs) are often given away free or at a relatively low price and therefore people do not attach a high value to the product. This can result in consumers collecting a new parent pack with the product every time the refill runs out rather than just the refills as required. An example of where this is particularly apparent occurs with razors, where because of special offers it is often cheaper to buy the razor and blade pack rather than just a pack of razor blades. Consequently more material is then disposed of than was originally intended by the designers.

## **5.2 Lighter Weight Refill Through Part Reuse**



Customer buys a new bottle of product and reuses the spray pump. Applications include cleaning products.

### **5.2.1 Drivers**

Again this type of refill is already used extensively so has some very clear business drivers for its adoption. One such driver as with the previous approach is the ability to encourage customer loyalty by tailoring the part which will be reused to have compatibility only with one design of refill. Again it is possible to make more profit on refills as overall manufacturing cost is reduced. From a marketing perspective there is an element of customer convenience which enables the purchase of refills at many different retailers including high street stores and supermarkets and at any time not just once the product is finished.

From a sustainability perspective this approach does reduce overall material usage but only by a small amount and also results in slightly less material going to landfill at the end of the refill's life.

### **5.2.2 Barriers**

From an organisational perspective there are not too many barriers to adopting this approach as it is relatively easy to replace one part such as a spray gun with a screw lid for example, in the manufacturing process without incurring large costs. There are however few cost savings to be made as the refill itself is almost the same size as the original packaging and therefore will cost almost the same to transport and display in store yet may result in lower profit margins. Additionally as with the "Lightweight Self Contained Refill Delivered Through Dispenser" in a retail environment it will be necessary to stock not only the original product but also a refill for it which may reduce the amount of space available for other lines and result in more SKUs. This links in closely with a marketing barrier as consumers may not find the refill in store and instead purchase a complete product again or even the wrong product by mistake. Another barrier of this type is that consumers may find it difficult to remember to detach and then store the reusable part if they have not already purchased a refill.

Other barriers to this approach include the fact that its sustainability benefits are very minimal due to the small amount of reuse being undertaken and the fact that a large bottle is still being disposed of. Although one could argue that this still provides some element of education to consumers about the importance of reuse it is a rather limited example which therefore provides a mixed message.



### **5.3 Empty Packaging Refilled In Shop**



Customer takes the original packaging back to the store for it to be refilled with the same product. Applications include shampoo, conditioner, shower gel, bath products and fabric conditioner.

#### **5.3.1 Drivers**

This approach to refills appeared to be very popular in the 1980s and early 1990s when the Body Shop were regularly refilling consumer's bottles in store. However there is less evidence that this is still as popular.

From an organisational point a view all the drivers centre on the fact that there are significant cost savings to be made by packaging many products in bulk containers rather than individual bottles. This leads to reduction in material costs, process costs and distribution costs due to the economies of scale.

This approach gives a very positive sustainability image to both the manufacturer/retailer and the consumer. It promotes responsible behaviour in consumers and encourages them to consider resource efficiency, recycling or reuse of the products they purchase. By encouraging consumers to reuse their packaging, significant environmental improvements can be made by reducing resource use, reducing waste to landfill and reducing energy in transport.

#### **5.3.2 Barriers**

As highlighted earlier this approach is used less now due to the number of barriers outlined below. From an organisational perspective there are many barriers; in particular the commitment required by the retailer to provide space for the large containers used to refill the packaging whilst at the same time stocking the smaller refillable containers for first purchase. This is linked closely with the fact that extra staff would be required to run the refilling operation, which will be a relatively slow process compared to the usual system where the consumer selects the product from a shelf and then pays for it. This approach can also have health and safety implications within a store, as spilt product could be dangerous. Finally from an organisational perspective this approach has a strong association with the Body Shop in the 1980s and may appear old fashioned and ultra green.

Marketing the idea to consumers may be difficult as the packaging to be refilled has to be empty before being returned to the store for refilling and therefore customers have to wait until the product has run out before buying a refill. This could cause significant consumer dissatisfaction as the product may run out before the consumer has the chance to buy a refill or may forget their packaging when shopping on the high street. Sales could then be lost to competitor products as the consumer may

select the convenience of another brand over the relatively small incentive to refill. This type of refill not only requires customer buy-in for it to operate effectively but also buy-in from store staff who are responsible for the operation of the system. This is likely to be achieved through education.

When considering sustainability there may be few improvements to be gained by using this approach as customers may stockpile full packaging at home just in case their refill runs out before they can get to the shop and therefore they may be no overall reduction in material use or waste to landfill.

## **5.4 Self dispense**



Customer takes reusable container back to the store where they refill it with the same product. Applications include dry goods, personal care products and cosmetics.

### **5.4.1 Drivers**

The self dispense approach to packaging has been used in the past by a range of different organisations with some degree of success. However for the sale of some products, such as dried foodstuffs, this approach is synonymous with the no frills, low cost stores. In other product areas it is used to project an image of customer choice and product flexibility or customisation.

From an organisational perspective this can reduce packaging costs as the customer is refilling previously purchased packaging and therefore the manufacturer need only package the product in bulk. This reduces the need for elaborate sales packaging and costly printing and results in low packaging costs.

Self dispense approaches offer a way to promote sustainability in a positive way by highlighting reuse and resource efficiency. It allows organisations and individuals to demonstrate responsible behaviour.

### **5.4.2 Barriers**

Barriers to this approach are the same as for the previous approach, 'Empty Packaging Refilled in Shop', as it offers the same challenges to organisations, consumers and sustainability.

## **5.5 Original packaging swapped for new product**



Customer returns empty packaging in person to a store or a reverse vending machine where they leave it and pick up a new product, alternatively the customer can post the product back to the manufacturer. The old packaging is refilled for future use by someone else. Applications include toner cartridges and single use cameras.

### **5.5.1 Drivers**

There have been very few examples of this approach to refills but the best known are the single use camera and the toner cartridge.

A key driver from an organisational perspective stems from the fact that overall packaging and materials costs are reduced because the packaging is refilled for use by another consumer. It can also offer the opportunity for manufacturers to use reverse vending machines to collect old packaging and dispense new filled packaging. This can speed up the transaction with the customer and make the collection of old packaging more cost effective. Automatic collection and dispensing enables the operation to be self contained, located close to the customer (rather than just in store) and making it more convenient for the customer. Reverse vending machines for drinks bottles occupy only one square meter of floor space (Platt and Rowe, 2002). An example of this type of machine is the Cartridge Swap Shop developed by Imaging Technologies Pty Ltd. This is a vending machine for toner cartridges and other office consumables which can also operate in reverse - by taking used cartridges back for recycling (Lofthouse, 2004). This system would need to be carefully designed to ensure good customer relationships are maintained by guaranteeing supply of the product and ease of operation.

Sustainability drivers include the fact that reuse of packaging and its promotion encourages high levels of recycling and raises consumer awareness. Reuse of resources will minimise overall material usage and reduce waste to landfill

### **5.5.2 Barriers**

From a business perspective there may be few barriers to this type of refill other than the fact that if automatic return and dispensing is to be employed then this should be robustly designed to minimise maintenance and ensure reliability. In addition retailers will need to store the returned packaging before it is refilled. Even with reverse vending machines, storage is required for some bottles unless they are collected daily by the companies refilling them.

The system itself would be difficult to plan as it not only requires customers to return packaging (either by post, via a shop or vending machine) but it also needs the packaging to return to the manufacturing facility via the logistics system. This involves considerable design to enable the system to accept and return packaging in a reliable and cost effective manner which is robust enough to be able to cope with any “rogue” packaging which may be returned.

## **5.6 Door To Door Delivery – Packaging Replaced**



On demand the customer receives full packaging and leaves empty packaging for supplier to collect, when they are finished. Returned packaging is refilled for other customers. Applications include milk bottles and vegetable box system.

### **5.6.1 Drivers**

This approach to refills currently operates in a few specialist fields such as milk delivery, where the company have a regular set of customers who purchase new products to a predetermined pattern. This enables companies to plan delivery of their products and collect used packaging at the same time. A key to its success is that the customer knows when deliveries will happen and is confident that used packaging will be collected. This is an interesting business model and requires close contact with customers enabling the company to diversify into other products, for example milkmen also deliver fruit juice, eggs, butter and even newspapers. This relationship results in high levels of customer loyalty and an opportunity to educate customers about issues of sustainability. In particular it promotes reuse but could also promote local sourcing.

The filling of reusable bottles in the drinks industry is 1/10th the cost of filling a one way bottle. Widespread uptake of the system may result in cost savings, which could potentially be passed on to the consumer to reward their loyalty and use of the system (Platt and Rowe, 2002).

It is clear that this approach has a number of drivers from a marketing perspective, in particular the customer convenience which is always a strong selling point. It ensures that customers can participate in the use of refills but without any particular commitment, it fits in easily with daily life. Finally, this type of refill approach is part of a long term service that the consumer buys into and is not viewed by the company or customer as a one-off purchase.

As with many other refill approaches this type would use less resources overall and result in less waste going to landfill.

### **5.6.2 Barriers**

A move to a system-oriented refill approach is likely to require substantial change in the business model. It is not an approach that can easily be incorporated into a company that is used to selling through retail outlets as they will incur high set up costs.

As the success of this model is largely dependent on the timing and reliability of a delivery it is very easy for small variances to result in customer dissatisfaction, for example if milk is delivered at lunchtime rather than in the morning the reason for using the system, is lost. Once customers are dissatisfied it is very difficult to get them to participate again.

This is obviously an additional and costly operation which must be considered. Overall significant investment is required to establish a refilling plant as new machinery and processes are required. A key element of this type of system is bottle washing and inspecting to ensure hygiene levels have been achieved.

## 5.7 Deposit system



Customer returns empty packaging to supplier for a financial incentive. Applications include soft drinks bottles and beer bottles. In the past this approach was used extensively in the beer and soft drinks industry within the UK but it has largely disappeared. However it is used extensively in other European countries and some provinces of Canada. For example in Finland 98% of all soft drink and beer packaging is refillable, in Denmark it is 90%, Netherlands 80% and Prince Edward Island in Canada is 100% (Platt and Rowe, 2002). This high use of refills is facilitated by an effective deposit system in all these cases.

### 5.7.1 Drivers

As with the previous example the reuse of packaging by the manufacturer creates a good opportunity to reduce the overall material cost of packaging. This in turn translates into an overall reduction in resource consumption for manufacturing the packaging. It also helps to tie customers into a particular brand by offering some financial incentive to returning packaging which could be linked in with purchasing new product.

In some European countries deposit-return systems operate as part of bottle pools in which brewers and soft drink companies share a few types of industry standard bottles. This minimises the cost of bottles and return logistics. The greater the trippage (i.e. the number of times a container is reused) the more the costs are reduced but the success of these systems depends on retailer cooperation (Platt and Rowe, 2002).

Reverse vending machines (as with “Original Packaging swapped for new product”) can facilitate the returns process by taking bottle returns and paying refunds thus reducing the overall space needed by retailers to operate this type of process.

As this approach is currently associated with the drinks industry there could be some novelty and therefore customer interest by introducing a deposit scheme for other types of packaging.

### 5.7.2 Barriers

There are a number of potential barriers to the adoption of this type of refill system, from an organisational perspective. There is the drawback of needing to offer a financial incentive to customers in order to overcome their inconvenience and the fact that returns are not necessarily related to new sale. From a marketing perspective this could be perceived as an old fashioned system which may no longer be relevant and may dissuade customers from engaging with the idea.

There is also the additional potential barrier created by the fact that customers need to be motivated to bring the packaging back and as such this approach may only appeal to certain market sectors. If customers choose not to return the packaging they can still purchase more products and then dispose of the packaging in the traditional way. This type of customer behaviour would result in any potential

sustainability benefits being lost and in fact may actually contribute to an increase in resource and energy use as compared to traditional packaging. This increase is due to the fact that this type of packaging is likely to be more heavy duty as it needs to have a longer life and therefore is more resource intensive.

The complexity and cost of logistics may create additional barriers when considering this approach. As with type 6 “Door to door delivery – Packaging replaced”, additional costs are likely to occur for cleaning the packaging prior to refilling.

## **5.8 Top up card**



Customer pays for a service which is delivered on the production of the payment card. Applications include downloadable music and payment systems for services such as mobile phones.

### **5.8.1 Drivers**

This type of refill is novel and the approach has been introduced recently driven by the growth of the internet as a mechanism for sales. In addition new smart card technology has facilitated this growth.

Top up cards enable a product and/or service to be delivered to the customer at exactly the time they want it, cutting out physical delivery and therefore reducing overall costs. The top up card is usually kept for the duration of the time that the customer engages with a service and therefore although the initial cost to the company may be high it is very cost effective over the lifetime of the service. This approach enables a customer to engage with the service in an easy and convenient manner.

One driver is the opportunity for the organisation to diversify where the service could be delivered therefore enabling brand proliferation and further marketing opportunities.

This approach to refills offers many benefits when considering sustainability. It offers a way to deliver a service easily to a customer without the need for additional resources. Consequently the top up card itself facilitates dematerialisation of the product, its packaging and its delivery resulting in significant reductions in resource use and waste.

### **5.8.2 Barriers**

As this approach is very new the barriers revolve around the fact that it is new technology which is currently only used in certain product areas. A great deal of innovation and imagination would need to be used to develop this for different areas. In addition, the move to a top up card would mean a change in the business model.

As this approach is highly dependent on technology one barrier would be the possibility of technical failure which would result in instant customer dissatisfaction. This approach is very specialised and only suitable for service-oriented products delivered virtually.

## **5.9 Creation**



Customer buys the constituent parts to make the product themselves. They buy refills to allow them to repeat the process. Applications include soft drink makers and orange juicers.

### **5.9.1 Drivers**

This approach offers organisations a new way to attract customers by providing an interesting and innovative product. Further revenue is then generated by the sale of refills. A well known example of this approach is Sodastream. This approach uses patented technology to ensure that compatibility of product and refill is only achieved between specific types and brands of products.

From a marketing perspective the novelty of this approach is a good selling point and encourages customers to engage with the brand. This in turn can lead to the quality and delivery of the product being associated with the brand resulting in higher revenue from sales of both the product and the refills.

### **5.9.2 Barriers**

As with the “Lightweight Self Contained Refill Delivered Through Dispenser” two manufacturing lines will be required in order to manufacture the pack and the refill, therefore incurring higher operation costs. In addition (again as with “Lightweight Self Contained Refill Delivered Through Dispenser”) in a retail environment it will be necessary to stock not only the product but also a refill for it which may reduce the amount of space available for other lines and result in more SKUs.

No clear sustainability benefits are achieved with this approach as economies of scale are achieved by factories when manufacturing large numbers of products therefore energy use per product would be higher in this instance. Also additional material is used for the packaging and refills with this approach creating an additional barrier.

## **5.10 Door to door delivery – packaging refilled**



Customer dispenses quantity required from a delivery van, using special containers and only paying for the quantity taken. Applications include detergent products.

### 5.10.1 Drivers

Currently there are not many examples of this approach to refills but it provides a mechanism to further develop an organisation with existing and strong environmental credentials. It demonstrates the use of product service systems in a business-to-consumer market place where it can result in higher operating efficiencies as the company continues to make a profit but at the same time reduces its environmental impact. This approach results in cost savings as less materials are used overall.

When considering sustainability this approach involving close customer relationships enables information to be provided on how to use the products to optimise their effects and minimise the amount used. This will therefore result in an overall reduction of resources used.

From a marketing perspective it offers customer convenience as it is delivered to the door and enables customer flexibility as to when they refill their products, as product can be refilled even if not completely empty. This approach combines the product with a service (home delivery) enabling a lower-level of customer effort.

A good example of this type of refill has been developed by Allegrini in Italy who have developed Casa Quick, a service providing added value to the product life cycle, based on home delivery of detergents. Casa Quick products are taken from vans, which move from house to house on a regular route. Each family takes the detergents needed from the van in the quantity required using special containers and only paying for the quantity taken. Casa Quick customers receive a kit of plastic flasks which are easy to carry from the house to the van and can be filled up even if not completely empty (Manzini and Vezzoli, 2002).

### 5.10.2 Barriers

This approach shares many characteristics with “Home Delivery” and therefore faces many of the same barriers. The exception being the issue of cleaning as the packaging is kept by the consumer and refilled rather than refilled by the manufacturer.

## 5.11 *Refilled with different product*



Once original packaging has been used it is refilled with a different product. Applications include toys filled with sweets or durable packaging used to store other products in. This approach is often aimed at children or the collectables market. It also may not be an intended design feature but something that just occurs.



### **5.11.1 Drivers**

From a marketing perspective enabling consumers to see your brand even when they are no longer using your product, or in an environment where that product is not usually used, is a strong driver for adopting this approach.

Sustainability drivers include the overall reduction in resource use and landfill as the customer is reusing packaging instead of purchasing an additional product to do that job.

### **5.11.2 Barriers**

When designing packaging to be reused in this way, durability will be very important, however manufacturing and transporting more durable packaging leads to increased costs due to increase in material use.

Whilst this approach enables visibility of a brand it is not possible to control how the consumer reuses the packaging and may lead to brand associations that the organisation would not like.

## **5.12 Dispensed concentrate**



Customer buys a dispensing unit. They also purchase refills containing concentrated product which are delivered through the dispenser. Applications include coffee machines.

### **5.12.1 Drivers**

As with “creation” this approach gives new business opportunities to organisations by providing a new product for customer to purchase which then requires regular purchasing of concentrated refills. It is therefore possible to get a steady income stream. By influencing the way in which the product is designed the refill manufacturer is then associated with a strong brand and a quality image that can have knock on effects in their other products. From a marketing perspective this approach enables customers to customise the product to their taste and mood as individual refills can be purchased to the customer’s requirement.

Some elements of the distribution costs could be reduced as concentrated refills are being transported rather than larger amounts of products. This obviously leads to sustainability benefits from reduced energy use in transport.

### **5.12.2 Barriers**

As with the “Lightweight Self Contained Refill Delivered Through Dispenser”, two manufacturing lines will be required in order to manufacture the pack and the refill, therefore incurring higher costs. Also, like “Lightweight Self Contained Refill Delivered Through Dispenser”, in a retail environment it will be

necessary to stock not only the product but also a refill for it which may reduce the amount of space available for other lines and result in more SKUs.

From a marketing perspective it may be difficult to convince customers to make the investment needed in order to participate in this system. There is also the ongoing cost to the consumer and inconvenience of maintenance and cleaning which may deter many. Also there is a risk for customers buying into this type of system when you are unsure how long it will operate for and how reliable it is.

From a sustainability perspective the barriers are that this approach may be considered to be a gimmick and used for a few months before disposing of the equipment. Consequently, a large amount of resources would be wasted. In addition the use of individual concentrated refills could use more resources and create more waste than standard packaging for this product.

### **5.13 Dispensed product**



Customer buys a dispensing unit. They also purchase refills which are delivered through the dispenser. Applications include personal care products in showers.

#### **5.13.1 Drivers**

This approach could develop considerable brand loyalty and visibility since a branded dispenser as a permanent fixture in a home would encourage customers to continue purchasing the necessary refills (as long as it is well designed and works) in the long term.

Overall less material and resources would be used as refills for a dispensing unit are likely to need less material for manufacture and would create less waste and use less energy for distribution. These would lead to cost savings for companies and sustainability benefits

#### **5.13.2 Barriers**

As with the “Lightweight Self Contained Refill Delivered Through Dispenser”, two manufacturing lines will be required in order to manufacture the dispensing unit and the refill therefore incurring higher operation costs. The initial purchase cost of the dispensing unit is likely to be relatively high so it may be difficult to sell the idea to customers. Organisations may also find it difficult to design the dispenser to have enduring appeal so that consumers will not want to change it frequently. Frequent changes would have significant sustainability problems.

### **5.14 Concentrate mixed in original packaging**



Customer buys a concentrated refill which they dilute with water and mix using the old packaging. Applications include laundry products.

#### **5.14.1 Drivers**

This approach, as with many of the others has advantages for the manufacturer in terms of reduced costs and ease of distribution due to the smaller weight and volume of the refill. It also enables customer loyalty and repeat purchasing to occur since it provides the opportunity to refill and reuse the original packaging.

The sustainability benefits are reduced material use, reduced energy used in distribution and reduced landfill of packaging material.

#### **5.14.2 Barriers**

As with many other refills, barriers relate to the retail environment where it will be necessary to stock not only the product but also a refill for it which may reduce the amount of space available for other lines and result in more SKUs.

There may also be issues related to health and safety if the customer is refilling at home as they may put the wrong refill in the packaging and potentially cause injury to themselves or damage to other products.

### **5.15 *Fill your own packaging***



Customers fill their own packaging with product in store. Applications include pick your fruit and vegetables.

#### **5.15.1 Drivers**

For organisations, this approach offers reduced costs. By packaging their products in bulk they can reduce material costs as well as printing and design costs as they will not need to use the packaging to “sell” the product on the shelf.

#### **5.15.2 Barriers**

As with the other approaches where products are refilled in store there is the potential for product to be spilt and cause accidents. In addition there might be hygiene concerns as the retailer or manufacturer cannot control the cleaning of the packaging.

Finally from a marketing perspective the company has no opportunity to brand the product that the customer takes out of the store as it loses its individual brand identity once it is put in the customers packaging.

## **5.16 Bulk purchase**



Customer buys in bulk and refills a sampler package at home. Applications include cooking ingredients (such as oil, vinegar, peppercorns) and household cleaning products.

### **5.16.1 Drivers**

Again this approach offers advantages in the economies of scale for packaging and transport resulting in cost savings and sustainability benefits as mentioned with previous approaches.

### **5.16.2 Barriers**

As with “Lightweight Self Contained Refill Delivered Through Dispenser”, two manufacturing lines will be required in order to manufacture the pack and the refill therefore incurring higher operation costs. From a marketing perspective it may be difficult to persuade customers to engage in this system as it requires them to have some dexterity for refilling the smaller container and also the space to store the bulk container.

For refills designed to be filled at home from bulk containers, additional costs associated with the need for additional space for the bulk containers and the smaller sampler packaging will be incurred by the retailer.

## **6 Challenges and Opportunities**

The main challenge from a sustainability perspective is how to prevent the whole refillable packaging system failing. As examples have shown when the systems fails it leads to the generation of more waste, therefore a robust system that considers all elements of the system, not just a refillable pack, needs to be designed.

From a marketing perspective there are two main challenges. Firstly, how to communicate to customers that the product is part of a refill system and secondly what the customer has to do to be part of the system. A further challenge is the increase in kerbside collection of packaging (both glass and plastic) which can cause confusion for customers who are unsure whether they should be recycling refilling packaging. Again communication will be the key to ensuring customers are able to make appropriate decisions.

There are also some interesting opportunities for companies considering refillable packaging. If refillable packaging is likely to become more widespread then the opportunity exists for design collaboration across the whole sector to develop industry standard packaging. This would minimise costs in the long term and make reuse and refilling much simpler for organisations and customers.

This would result in sustainability benefits as it would prevent customers from buying different packaging if they changed brands.

With increasing competition in the market place an opportunity exists to attract consumers who are concerned about the environment as they will form a more positive image of a brand that has some environmental attributes (Lonergan et al., 2001). In particular some research has shown that consumers would switch brands to those with more environmentally responsible packaging (Ottman, 1993). Therefore a shift to more reusable packaging would create a good opportunity to promote the brand to environmentally responsible consumers.

A final opportunity is afforded to those large retailers who wish to pursue refillable packaging. Because of their size these retailers either have their own manufacturing plants and therefore are able to make these radical changes, or they are large enough to influence their suppliers to make the change.

## **7 Conclusions**

Whilst it is generally believed that the increased use of refills would lead to sustainability benefits for many sectors of industry it is clear from the analysis that many barriers need to be overcome before this can be successful. At the same time the research has shown that there can be positive drivers for industry and consumers to encourage the increased use of refills. For these benefits to be realised, future design of refills and the systems in which they operate must ensure that the barriers are designed out and the drivers are enhanced.

Within the personal care market this project is now focussing on applying the lessons learned to the development of a refillable packaging system for 'body wash products' with the intention of developing a range of concepts suitable for prototyping and testing with consumer groups.

As a follow on from this work the team ran a workshop with personnel from Boots in order to map the drivers and barriers for the different types of refills against the supply chain in order to identify where the key dependencies are (see Appendix 4). This fed into the design stage of the project by ensuring that any refills designed meet the requirements of the specific supply chain elements.

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