APPENDIX 5: Refillable packaging systems - lessons for industry

WR0113: Objective 6:1

Deliverable for DEFRA Waste and Resources Evidence Programme

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1 The focus of the report

This report meets part of Objective 6 “To identify generic lessons for the use of refillable packaging in industry”. It presents the background which led to the project, briefly outlines the methodology used to better understand refillable packaging systems and summarises the key lessons which have emerged from this 2 year collaboration between Loughborough University and Boots. The findings which have emerged are presented in three categories:

1. Findings which relate to refillable packaging in general.
2. Findings which relate to refills where ‘concentrate is mixed in original packaging’ (the type of refills developed and prototyped in this project).
3. Findings which relate to refills for the personal care market.

It is anticipated that the general lessons about refills will be useful to anyone trying to deliver any type of refill system to the general public. The more in depth lessons, which relate specifically to refills which draw on the use of ‘concentrates mixed in original packaging’ will be able to be transferred to any other refills of this nature. Finally the lessons specific to personal care products will be valuable to those working in this sector with an interest in delivering an array of refill types.

2 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 (LRRA, 1996). 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 (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, and its potential is clearly recognised by bodies such as WRAP and DEFRA. However few research findings relating to the opportunities and challenges created and faced by refillable packaging, have been published. A report by Darlow (2003) suggests that 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. It is felt that recent progress in the field of 'product service systems' might offer an opportunity to address this issue. In light of this, the project '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.

3 Methodology

The overall aim of the project 'Refillable Packaging Systems,' was to develop a refillable packaging system for 'body wash' and to investigate its feasibility with respect to consumer acceptance (female customers, aged 21-40) and sustainability improvements. In order to achieve the project aim a broad range of qualitative methods were used to collate background understanding, develop design concepts and test the viability of the design solutions (see Figure 1).

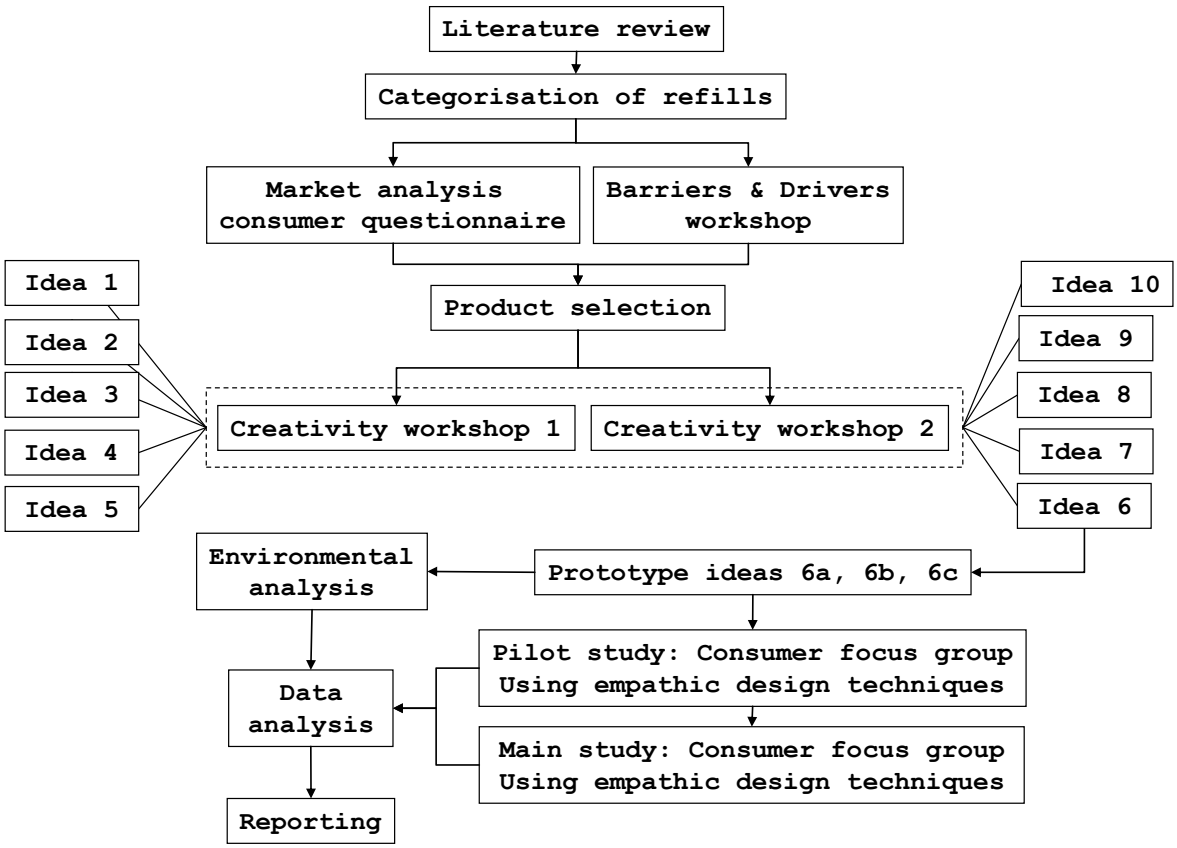

Figure 1 Diagram to summarise the key stages of the project

In summary, this started by combining a literature review, consumer questionnaire and industry based workshop using a visual template derived from the work of The Grove Consultants International (2001) to better understand refills and how they are perceived by consumers and industry. This work led to an unforeseen opportunity to categorise different types of refills, which in turn led to the recognition that each has different benefits and disadvantages from a consumer, industrial and sustainability perspective (see section 4).

Following this, a series of educational activities, creativity techniques and design activities were combined together to form the 'creative workshop' programme. The programme aimed to; encourage the participants to think about the different types of refills available, outline the attributes of body wash products, feed in other sources of inspiration, and provide the group with the time to generate ideas which met the refillable packaging systems brief (Lofthouse, 2007). The same programme was run through two parallel workshops. As a result of these workshops, a wide range of different solutions for delivering body wash products through a refillable packaging system were generated.

The next phase of the project focused on testing and involved trialling the three prototyped concepts in consumer focus groups. The 2 hour focus group programme, which combined together a series of different activities, aimed to understand how the -participants felt about the prototypes – whether they liked them, engaged with them and/or accepted them, and to identify what elements they instinctively understood and what elements needed to be explicitly explained. Qualitative analysis was carried out by hand using a 'coding and clustering' technique (Strauss and Corbin, 1990, Robson, 1993).

In addition to a number of generic conclusions (section 5) it has also been possible to form a much more detailed understanding of concentrated refills that are mixed with water in the original packaging (section 6), as well as gain insights into developing refills for the personal care market.

4 Categorising refills

In the limited literature available, refills are often dealt with under one generic heading which treats all refills the same and assumes that they all have similar attributes and consumer interactions. However, during the early stages of this research project, it became apparent that there are a wide range of different types of refillable packaging approaches. Through a market analysis and a literature review, sixteen different types of refillable packaging were identified and classified with respect to their delivery mechanism and the level and nature of their consumer/business interaction (see Table 1).

Table 1 Summary of the 16 types of refillable packaging identified and defined to aid the investigation into consumer perceptions of refills

	Refill Example	Refill Approach	Description
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 & air fresheners.
2		Lighter weight refill through part reuse	Customer buys a new bottle of product and reuses the spray pump. Applications include cleaning products.
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.
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		Original packaging swapped for new product	Customer returns empty packaging to a unit where they leave it and pick up a new product. The old packaging is refilled for future use by someone else. Applications include toner cartridges and single use cameras.
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.
7		Deposit system	Customer returns empty packaging to supplier for a financial incentive. Applications include soft drinks bottles and beer bottles.
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.
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.

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.
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.
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.
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.
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.
15		Fill your own packaging	Customers fill their own packaging with product in shop.
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 Generic findings relating to refills

This section will pull together a number of generic findings which relate to refills, looking specifically at consumer perceptions, business drivers, business barriers and the associated risks.

5.1 Consumer perceptions of refills

A number of attributes which lead to the consumer having either a positive or negative experience of refills have been identified (Lofthouse and Bhamra, 2006a), and are summarised in Table 2. There are a number of reasons why people actively buy refills, these have been grouped into practical, brand related, environmental and other, and are presented in Table 3 (Lofthouse and Bhamra, 2006a).

Table 2 Attributes leading to a positive and negative experience of refillable packaging

Attributes leading to a positive experience	Attributes leading to a negative experience
Good product quality	Expensive refills in giveaway parent pack
Convenient delivery	Inconvenience / requiring additional planning
Good value	Take up more space
Less packaging and or product waste	Hassle of maintenance
Easy to use	Increased waste
Clean and hygienic	Poor product quality
Takes up less space	Bad delivery
Light to transport	Bad quality packaging
No mess	'Fiddly' to refill
Cheap	Concerns over how long refill will be available for
Quick to use/refill	Incompatibility between systems
Incentives / rewards for use	
Suitability for purpose	

Table 3 Reasons why people actively buy refills

Practical	- People without cars report specifically buying refills because they are smaller, lighter and easier to carry home. - They take up less room. - Ease of use/delivery.
Brand related	- Product quality. - They have had a good past experience. - Already engaged with and like the brand being sold as a refill.
Environmental	- To reduce waste and/or actively reduce the amount of stuff they buy. - Altruism or the desire to be environmentally as long as this is linked with product quality, and/or cost.
Other	- They are fun. - They are considered the 'norm'. - Cost as long as this is linked with product quality. - There is a clear reason why the product is sold as a refill.

Unsurprisingly it was seen that in the majority of cases positive attributes lead to repeat purchases whereas a negative experience can deter a repeat purchase. However the findings also suggest that as long as the refill is delivered well, people do not mind whether or not they are given a choice to participate.

Research has also shown that customers have one of two perceptions when it comes to the cost of refills, that they are cheaper or that they *should* be cheaper that the 'original' product. This means that the price incentive is expected and therefore is a 'must have' attribute rather than a 'delighter'. As such if it is not delivered, customers are disappointed (Matzler et al 1996). The results of the questionnaire however suggested that the price only becomes an issue if the quality is there, i.e. without the quality consumers will not want the product, even if it is cheap (Lofthouse and Bhamra, 2006a).

Refillable packaging was generally perceived as being better for the environment by the consumers interviewed and involved in the focus groups. The reasons they gave for this were that:

- it uses less material,
- it generates less waste to go to landfill,
- there is less impact through manufacturing,

- it reduces the amount of different containers going into shops.

The same consumers generally perceived refillable packaging as being more socially responsible, however only environmental reasons as to why this was so were cited. This suggests that the consumers could not see direct social benefits to using refills. Although it would be difficult to argue that reducing landfill is not socially responsible, this way of thinking about social responsibility does vary from the way that social responsibility is normally considered by academics when talking about sustainability. Typically social responsibility might include issues such as inclusivity, safety and reducing consumption levels.

5.2 Business drivers for refillable packaging in general

Many businesses see sustainability as an important issue. From a sustainability perspective the main drivers for the use of refillable packaging systems stem from the potential to minimise packaging for refills, which reduces material use and ultimately slows resource depletion. The lighter weight of refills 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. Where the packaging is reused this further minimises overall material usage and reduces the amount of waste going to landfill. Companies can also highlight reuse and resource efficiency through the use of refills, as a way of demonstrating responsible behaviour.

There are also a number of economic drivers for refillable packaging. Refills can lead to an overall reduction of packaging costs, and often leads to higher profit margins either because they are designed, from an economic perspective, to use minimal materials, are re-used by another customer, or the customer is refilling previously purchased packaging. The positive sustainable impacts mentioned above will also reduce packaging costs. In addition to this, many types of refills can encourage increased levels of customer loyalty, which can lead to increased revenue (Lofthouse & Bhamra, 2006b). Finally, refills offer the opportunity to present consumers with greater choice, flexibility and customisation.

5.3 Business barriers to the use of refillable packaging in general

As with the business drivers, many of the barriers to use of refills by businesses are common among many of the different types of refills (see Lofthouse & Bhamra, 2006b). From an organisational perspective there is a barrier in the commitment required by the retailer to provide space for both the parent pack and refill used in many types of refill system and this leads to an increase in stock keeping units for retailers. There are also barriers related to potential costs which might arise from additional manufacturing lines, additional staffing, additional cleaning / refurbishment, or additional return logistics.

From a marketing perspective another barrier associated with refills is the potential difficulty in establishing and then retaining brand loyalty and customer buy-in. It may be difficult to convince

customers to make the initial investment required to take part in some refillable systems. For further details on specific barriers related to individual refill types see Lofthouse & Bhamra (2006b).

5.4 Risks associated with refills in general

There are a potential number of risks associated with refillable packaging. These can be risks from a sustainability perspective, risks from a consumer perspective and risks from a business perspective.

From a sustainability perspective if a customer chooses to circumvent a refill system by always buying a new pack, any potential sustainability benefits would be lost. In fact this may contribute to an increase in resource and energy use compared to traditional packaging, since this type of packaging is likely to be more heavy duty as it needs to have a longer life. In addition to this, systems which are gimmicky and used only for a few months could lead to the waste of a large amount of resources.

Risk from the consumer perspective lies in the fact that they do not know how long systems they are buying into will be available for and they do not necessarily know how reliable they will be (good brand association can help here).

5.5 Conclusions

There are a wide range of business and sustainability advantages to engaging with refills, if the consumer needs can be met and the systems be designed to work effectively. The importance of effectively communicating refills to consumers has been highlighted on a number of different occasions. It is important to ensure that:

– positive attributes of the product are promoted e.g. that this approach will actively save them money,

– negative attributes are mitigated against e.g. that customers know it is easy to refill, not messy, not expensive etc.

– customers know that they can/should refill and how to do it.

Unless this is done the business and sustainable benefits will not be achieved. However it is believed that once these issues have been identified, with careful design many can be mitigated against, especially if they are supported by a collaborative approach to development.

6 Findings relating to ‘concentrate mixed in original packaging’

Through the project three concepts for the delivery of body wash to women aged 21-40, via a refillable packaging system were developed. These concepts aimed to compete with the current mode of delivering Botanics shower gel, which is through a 200ml blended polymer tube with snap fit PP cap, as illustrated in Figure 2. They were all based on the ‘concentrate mixed in original packaging’ approach (see Figures 3, 4 and 5).

Figure 2 Original 200ml Botanics Shower gel packaging

75 µm dissolvable refill (PVOH) containing concentrated energising shower gel

Pump bottle with PET bottle and PP lid with pump made from a variety of materials.

PET tub with recycled aluminium lid

Figure 3 Idea 6a – Dissolvable sachet containing concentrate, mixed with water in pump bottle and delivered through pump bottle

Blended polymer tube with PP snap fit lid

Pump bottle with PET bottle and PP lid with pump made from a variety of materials.

Figure 4 Idea 6b - concentrate delivered in tube refill mixed with water in pump bottle and delivered through pump bottle

Pump bottle with PET bottle and PP lid with pump made from a variety of materials.

3-layer laminate sachet of PET/ aluminium/ polypropylene film.

Figure 5 Idea 6c - concentrate delivered in sachet, mixed with water in pump bottle and delivered through pump bottle

Through the development, prototyping and consumer testing of these concepts a number of lessons have been identified. These will be summarised in the sections below.

6.1 Technical issues

The key driver for developing refills where the 'concentrate is mixed in original packaging' is to reduce the amount of water that is transported, saving on materials and transportation costs. This currently means that the concentrate needs to be mixed with tap water in the consumers' home. This raises issues to do with water sterility, safety and the visible growth of bacteria over a period of time, a situation which is exacerbated by the warm moist conditions of the bathroom. Research into how to develop formulation around this issue is currently ongoing. Interestingly, during the focus groups, one of the participants recognised this might be an issue, but the participants unanimously agreed that,

> "if it wasn't safe it wouldn't be on the market"

Illustrating their belief and trust in the Boots brand.

For idea 6a where dissolvable packaging is used, further development into how the refills should be stored will be needed to ensure that a tub full of refills (6 months worth of shower gel) is protected from being accidentally 'dissolved'.

6.2 *Consumer perceptions of 'concentrate mixed in original packaging'*

Only 26% of respondents to the questionnaire (Lofthouse & Bhamra, 2006a) had used this type of refill in the past and the majority of their experiences related to fabric softener - though fruit juice was referred to by two respondents. Most of the respondents had found their experience of refills of this nature to be good or very good, citing reasons such as price, the fact that it takes up less space and is easy to use as the motivators. The respondent who had a neutral experience identified that

> *"you have to remember not to throw the bottle away otherwise product is useless"*

Following on from the questionnaires the focus groups found that in general consumer feedback about refills of this nature was positive – but there was a strong message that these types of refills MUST be delivered in the right way.

6.2.1 Perceived value

Even though the three refill approaches produced the same amount of shower gel which was delivered in exactly the same manner, the different refill approaches evoked very different responses from the participants to the focus groups.

6a - the dissolvable concept was perceived as having added value (mainly because of the tub that the refills came in).

6b - the tube received the heaviest criticism. The participants wanted to drain ALL of the contents out of the refill, otherwise they felt that they were wasting product. A few raised

concerns that this method of refilling might affect the mix ratio. Additionally, they did not like the idea of throwing away a relatively large tube and so this prototype was not investigated further.

6c - the sachet provoked mixed responses, ranging from the perception of it being cheap and cheerful, to it being perceived as a high end product, depending on what products it was associated with.

6.2.2 Cost/size relationship

During the study we identified an interesting relationship between the cost and size of refills, which had not previously been recognised in the literature. If a refill is too small and looks 'medium end', consumers are not willing to pay much for it. However if it is really small and packaged well then they will pay more for it – like a diamond. During discussions with Arno Melchior, Global Packaging Director at Reckitt Benckiser we realised that they have also experienced this and decided NOT to concentrate their products as much as they could as it makes them too small to sell. Discussions between Boots and Unilever also served to confirm this finding.

Discussions during the focus groups suggested that 6c might be expected to cost £3.50 - £4 for a starter kit (1 pump bottle and 1 sachet) with refills costing £1.99, compared with £6 for 3 refills, for idea 6a, though the participants would commit further than this. They did however feel that 6a would be more expensive than the other options. During the discussion the participants were aware that the original tube retails for £3.00 (2007).

6.2.3 Effective communication

Effective communication is critical to the success of refillable packaging systems. Labelling and packaging must be clear and clearly communicated:

- That the refill is a concentrate.
- Why addition of water is necessary.
- What the packaging is made of and what to do with it at end of life.
- Exactly how to carry out the refill process.
- How the formula will mix and how long it will take.
- Full use instructions.
- How long the product will last for.

Figure 6 illustrates the level of detail required on the pump bottles for idea 6a.

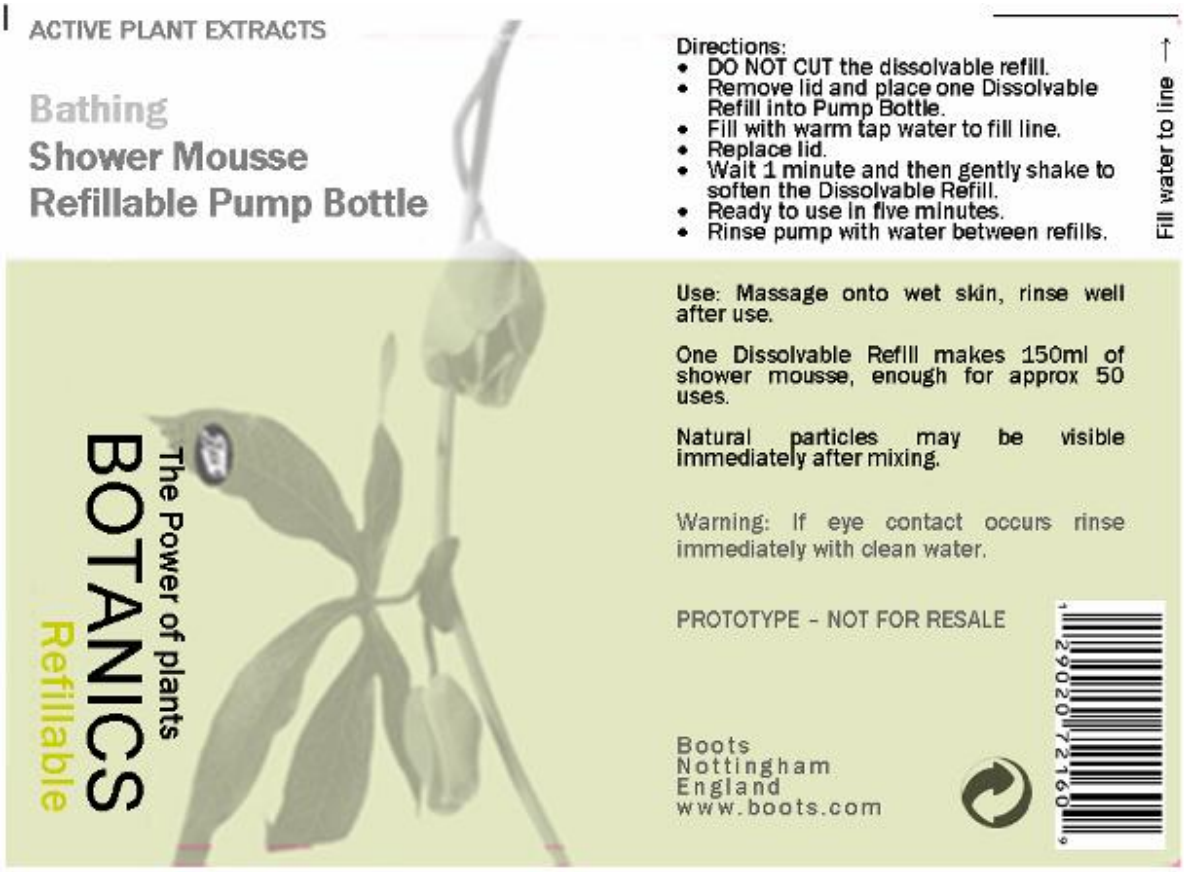

Figure 6 Example of level of detail required on the pump bottles for idea 6a

It must also be immediately obvious that a refillable system is being sold, which means that it must be easy to differentiate between the refill and the original pack.

6.2.4 Functional requirements

It is essential that refillable packaging systems adhere to certain functional requirements, these include the following:

- That the refill process must be easy and as intuitive as possible.
- That the packaging and labelling must be durable enough for repeated use.
- That consumers must be able to drain / use all the contents of the refill (or not be able to see 'dregs' as this is observed as being wasteful by participants.
- That the storage of refills within the home must also be considered.
- That refills must be inclusive (arthritic hands etc).

6.2.5 Marketing

A number of issues were found during the consumer focus groups which relate to the marketing of refillable packaging systems.

- Consumers need to be told 'what the point of it' is.

- System packaging and marketing must reflect the value of the product (changing the aesthetics of the design of the tub used to deliver the refills for concept 6a, see Figure 7) made a huge difference to the perception of value.
- Consumers relate to what they know (such as liquid tabs for washing machines, travel bottles, bath gems etc.), so building on these approaches is beneficial BUT also be aware that they know what they pay for them.

Figure 7 The tub used during the pilot studies (left) and the main study tub (right).

6.3 Environmental issues associated with 'concentrate mixed in original packaging'

In order to evaluate the relative environmental impact of the prototypes, an environmental analysis was carried out on ideas 6a, 6c and the original. By this stage idea 6b had been discounted (see section 6.3.1). The analysis was carried out over a 6 month period to allow time for the 'refill' element of the concepts to be capitalised on. Figures 8, 9 and 10 illustrate the amount of product and packaging used for each system over a 6 month period.

Figure 8 Packaging and product required for 6 months worth of shower gel delivered through concept 6a packaging

Figure 9 Packaging and product required for 6 months worth of shower gel delivered through concept 6c packaging

Figure 10 Packaging and product required for 6 months worth of shower gel delivered through original packaging

The prototypes were analysed using the Ecodesign web (Lofthouse & Bhamra, 2000) and the Eco Indicator (PRé Consultants, 2001). For more detail on these processes Appendix 4.

6.3.1 Environmental analysis of concept 6a compared to the original packaging

- Over a 6 month period the weight of material used in the packaging for concept 6a is 0.082kg, equating to **59.8% less than the original packaging** (0.204kg).
- Over 6 month period concept 6a requires 0.1298kg of material (comprising the packaging and shower gel product) to be transported, to deliver energising shower gel to the consumer, compared with 1.392kg in the original product. This means that **90.68% less material is transported with idea 6a**. This will lead to cost savings related to transport and cost savings related to materials usage.
- Over a 6 month period, idea 6a would generate 0.038kg of material which would have to be sent to landfill, compared with the 0.204kg of material which would sent to landfill in that period for the original packaging. This equates to **81.37% less landfill waste material**.
- 0.047kg of material can be recycled for idea 6a over the 6 month period, compared with 0kg of material from the original packaging.

- For a 6 month period the Eco indicator score (PRé Consultants, 2001) for concept 6a is **22.41 compared with 79.86** for the original packaging. This reflects a product impact based on its effects on human health, ecosystem quality and resources. The lower the result, the better the product.
- The Ecodesign Web for concept 6a is much more positive than for the original packaging over a 6 month period (Lofthouse & Bhamra, 2000).
- **Less surfactants** are needed in the product when dispensed via a pump pack which has environmental benefits.
- **Reduction in transport costs** as 'water' portion of shower gel is not being transported each time.
- Consumer trials indicated that female consumers between the ages of 21 – 40 felt concept 6a was 'more special' and something they would buy as a high end product or a gift.
- Consumer trials showed that consumers were not concerned about safety issues – they assumed that if it was on the market it would be safe.
- Concept 6 is likely to lead to prolonged consumer buy in due to initial purchase being for 6 months worth of product.
- Concept 6a would fit within current supply chain models.

For more details see reports Lofthouse V and Trimingham R (2007a; 2007b and 2007c).

6.3.2 Environmental analysis of concept 6c compared to the original packaging

- Over a 6 month period the weight of material used in the packaging for concept 6c is 0.076kg, equating to **62.75% less than for the original packaging** (0.204kg).
- Over 6 month period concept 6c requires 0.124kg of material (comprising the packaging and shower gel product) to be transported, to deliver energising shower gel to the consumer, compared with 1.392kg in the original product. This means that **91.09% less material is transported with idea 6c**. This will lead to cost savings related to transport and cost savings related to materials usage.
- Over a 6 month period, idea 6c would generate 0.048kg of material which would have to be sent to landfill, compared with the 0.204kg of material which would sent to landfill in that period for the original packaging. This equates to **76.47% less material**.
- 0.028kg of material can be recycled for idea 6c over the 6 month period, compared with 0g of material from the original packaging.
- For a 6 month period the Eco indicator score for concept 6c is **26.26 compared with 78.86** for the original packaging (PRé Consultants, 2001). This reflects a products impact based on its effects on human health, ecosystem quality and resources. The lower the result, the better the product.
- The Ecodesign Web for concept 6c is much more positive than for the original packaging over a 6 month period (Lofthouse & Bhamra, 2000).
- Less surfactants are needed in the product when dispensed via a pump pack.
- Reduction in transport costs as 'water' portion of shower gel is not being transported each time.
- Consumer trials showed that consumers were not concerned about safety issues – they assumed that if it was on the market it would be safe.
- Concept 6c would fit within current supply chain models.

6.3.3 Conclusions

Both concepts were significantly better than the original packaging in all environmental areas due to the re-use of the primary packaging.

There was however very little difference between the two refillable concepts tested (6a was expected to perform better). This was mainly because the dissolvable refills for prototype 6a came in a heavy tub. If this could be replaced with a lighter box which maintains its aesthetic appeal, idea 6a would have greater environmental savings.

6.4 Business drivers and barriers relating to refills where the 'concentrate is mixed in original packaging'

During the Drivers and Barriers workshop (Lofthouse & Bhamra 2006b) a number of potential business and sustainability drivers for refills where the concentrate mixed in original packaging were identified:

- Reduced resource depletion.
- Reduced impact of distribution.
- Reduction in the amount of waste going to landfill.
- Reduces packaging costs.
- Encourages customer loyalty.
- Provides marketing opportunities.

These all proved to relate to the prototypes that were developed. In addition to this it was recognised that two of the prototypes were seen to 'demonstrate responsible behaviour' because they reduced the amount of waste produced.

A number of potential barriers were also identified:

- Possible loss of brand lock-in
- Increased stock keeping units (SKU)
- Increased costs of two manufacturing systems
- Health and safety risks

The novelty of the approaches at the moment limit the chance of loosing brand lock-in as concentrates are so new on the market. There is still potential for this to become an issue in the future. The other anticipated barriers are likely to affect the refill approaches discussed here.

This type of approach does however mitigate against 8 other potential barriers identified – including:

- Possible increase in use of resources.
- High initial cost and difficulty in maintaining enduring appeal.
- Need for financial incentive.
- Perceived as old fashioned.
- Costs of refilling.

- Costs of returning,
- Costs of cleaning.
- Costs of refurbishing packaging.

The concepts presented do risk causing possible consumer inconvenience - depending on how easy the bottle is to clean. In addition to this, at the moment all the concepts are dependant on developments in product formulation in order to make them technically feasible.

6.5 Conclusions

This section has focused specifically on findings related to concentrates mixed in original packaging. It has been seen that in general this refill approach and the way it has been delivered has been well received by both consumers and the Boots team. In an ideal world it would have been excellent to have shown the concepts to the different parts of the supply chain to illicit their responses, however it was felt that this would cause confusion and potentially lead to problems – especially as idea 6a is not yet feasible. However due to the diversity of the project team involved, most of the areas within the supply chain have been covered.

In addition to this both refillable approaches were seen to lead to considerable environmental savings over the original packaging. These could be further improved by developing the packaging design further although the original packaging could also be quickly improved to reduce its environmental impact (i.e. by designing for recycling). It is clear that it is important to design refills so that they reflect their single use to the consumer and 'make sense' as refills.

The positive findings have however served to demonstrate to the Boots team that this approach is worth pursuing and as such research into making idea 6a feasible, is ongoing.

7 Findings relating to refills for the personal care market

This section outlines the key lessons that have come out of this research project relating to developing and delivering refills for the personal care market.

7.1 Opportunities within the personal care market for refillable packaging

Through the early stages of the study it was possible to identify a number of different types of products that people felt would be appropriate to be delivered as refills – the most popular suggestions were shower gel/bubble bath, shampoo and conditioner, soap and moisturiser (Lofthouse and Bhamra, 2006a). Two respondents felt that these sorts of products would be easiest to refill but generally the motivation related to cost savings on everyday products, and the potential for positive environmental impact.

Feedback from the workshop participants highlighted a willingness to refill higher end products such as 'Facial cleanser, face wash, hair products' due to a willingness to take more time over these sorts

of products. It was also felt that the act of 'mixing' makes it feel as though you are getting a specialised / luxurious product. One clear opportunity for refills highlighted by the consumer testing was in the high end / pamper / gift end of personal care.

Workshop participants also identified a number of products that were considered inappropriate for refill (Table 4). Toothpaste was the product which most respondents said they would not like delivered as a refill, due to concerns about hygiene and practicality. One respondent felt that refills would be inappropriate for shower gel and shampoo because they *"like a change of product"*, which assumes this would not be possible with refills. Interestingly the variety offered by the Krupps coffee machine is exactly what has made it so popular.

Table 4 Products identified by customers as being inappropriate for refills against the number of respondents.

Product type	Number
Toothpaste – hygiene	14
Hair products – fiddly, chemicals	7
Deodorant	6
Feminine care	2
Shower gel – like a change of product	3
Moisturiser	2
Make up	5
Talc	1
Facial products	5

In short although these findings did come out of the questionnaire the authors do not believe these are definitive truths but instead believe that the success or failure of these types of products as refills will very much depend on how the refills is presented, how it is sold and who it is sold to.

7.2 *Marketing related findings*

- The way that products are delivered, when part of a refill system can lead to better customer value e.g. a 150ml pump bottle will last 2 ½ times longer than a standard 200ml tube, this needs to clearly communicated to consumers.
- Environmental benefits should be promoted, even if they are not the key message e.g. Pump bottles allow less surfactant to be used.
- Findings from the focus groups (Lofthouse V, Bhamra T and Trimingham R 2007b) clearly identified that smell and cost and not packaging were the key drivers for most sales of personal care products. This means that for the concepts presented in this report an in store tester would be needed to allow the customers to smell the product and try the pump.
- For the body wash product we identified that the consumers were looking for some type of added value – we identified a desire for luxury and additional quality. Reduced cost might also have the same allure but wasn't tested for in the body wash trial.
- There was a general perception that within the personal care market refills would work better when viewed / marketed as high end products.

- It is important to be aware that there are a number of issues related to cost and size which need to be taken into consideration (section 6.2.2).

7.3 Conclusions relating to developing refills for personal care products

The findings from this research project have indicated that not only is refillable packaging appropriate for body wash products, but also has further opportunities in other personal care markets. There is a key limitation when designing refills for this market, in that consumers do not necessarily want a shower gel (shampoo, conditioner) to last as long as possible, as they like a change of 'flavour' and get bored of products. It was suggested that between 1 and 3 months would be 'long enough'. From an environmental perspective this means that there are limits as to how environmentally friendly refillable packaging can be, if you want to avoid offering a years worth of shower gel. For example, based on a concentrate level of 1:10, 75ml of concentrate would last the consumer a year and a half and would have to retail at £45.

8 Conclusions

Through this project a number of generic conclusions have been drawn, but it has also been possible to move beyond generalisations and form a much more detailed understanding of concentrated refills that are mixed with water in their original packaging, as well as gaining insights into developing refills for the personal care market.

If refillable packaging is designed carefully & applied to appropriate products, it has a great opportunity to reduce household waste however we currently only have a ***very limited*** understanding of the types of products that could work as refills. Focus groups – using empathic design techniques are a good way of finding out what customers REALLY want and will ACCEPT.

We believe that to be truly successful refills must perform for the consumer, environment and business, and to do this the **design brief** must incorporate both consumer and environmental needs. This means it must offer good quality; be very easy to use & appropriately delivered; be clearly communicated; be offered through a brand they like; and represent good value whilst radically reducing the amount of 'stuff' produced and moved around.

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