Extended producer responsibility for packaging waste in South Africa: Current approaches and lessons learned

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ARTICLE INFO

Article history:
Received 21 April 2009
Received in revised form 8 July 2009
Accepted 15 July 2009
Available online 11 August 2009

Keywords:
Waste management
Recycling
Extended producer responsibility
Packaging waste
Economic instruments
Developing countries

ABSTRACT

Extended producer responsibility (EPR) is a policy concept aimed at extending producers’ responsibility for their products to the post-consumer stage of their products’ lifecycle. This paper examines various approaches to implementing EPR for various types of packaging waste in South Africa, focusing in particular on their effectiveness in stimulating the recovery of post-consumer packaging material for recycling. In particular, the approaches adopted in the plastic bag, steel beverage can, glass and polyethylene terephthalate (PET) industries are examined. It is found that voluntary industry initiatives (as in the can, glass and PET industries) can be effective in stimulating recovery in a developing country context. By contrast, in the South African case, mandatory, government-imposed regulations (as in the plastic bag industry) have not been effective in stimulating recovery. However, this does not imply that voluntary initiatives are always more effective than mandatory regulations. Instead, it is likely that the differing results for plastic bags as opposed to other packaging waste streams in South Africa can be explained by the differing characteristics of the former; in particular, their reusability (particularly for bin liners) and low recycling value relative to the other waste streams. In addition, in the case of glass and PET, a major incentive behind the voluntary initiatives was the desire to avoid punitive regulations like those imposed in the plastic bag industry. It could therefore be argued that mandatory regulations in the plastic bag industry had the indirect effect of stimulating recovery in the glass and PET industries. © 2009 Elsevier B.V. All rights reserved.

1. Introduction: EPR and the waste hierarchy

Recycling as a waste management option has clear benefits over final disposal to landfill. It saves natural resources and energy; leads to reduced production costs associated with using recycled as opposed to virgin materials; reduces the costs of waste management; reduces environmental impacts, demand for landfill airspace and other costs associated with landfilling; and generates income and job creation opportunities for the poor and unemployed (e.g. Batool et al., 2008; Gregory and Kirchain, 2008). However, these benefits are not taken into account in the prices faced by the various actors in recycling markets, which therefore fail to provide incentives for recycling as a viable alternative to disposal (Stromberg, 2004; Nahman and Godfrey, 2008). These external (unaccounted for) benefits are a type of market failure. In addition, other types of market failure, such as information failure, technical constraints and search costs, act as barriers to the development of a viable recycling industry (Stromberg, 2004).

By contrast, final disposal to landfill imposes significant costs on the environment and broader society, in the form of various health and environmental hazards. However, these are not reflected in the production costs incurred by producers, or in the municipal waste collection and disposal charges faced by consumers, and there is therefore no incentive to reduce disposal to landfill (Wilson, 1996; Stromberg, 2004; Nahman and Godfrey, 2008). Disposal to landfill continues to be the cheapest (in financial terms) and therefore most attractive option for waste management in South Africa (Nahman and Godfrey, 2008). However, the external costs associated with disposal to landfill, and the external benefits associated with recycling, imply that disposal to landfill is in fact the more expensive option, in terms of overall social costs.

One way of overcoming these ‘market failures’ that has attracted increasing attention in recent years, including in SA (Republic of South Africa, 1998; Department of Environmental Affairs and Tourism, 1999; Republic of South Africa, 2003a), is extended producer responsibility (EPR). EPR can be defined as “an environmental policy approach in which a producer’s responsibility for a product is extended to the post-consumer stage of the product’s lifecycle, including its final disposal” (OECD, 2001, in Widmer et al., 2005, p. 446). In line with the polluter pays principle, EPR shifts the physical and financial responsibility for the environmental impacts (waste) associated with products throughout their lifecycle from society as a whole (and municipalities in particular) toward the generators of waste. Generators of waste include both producers (broadly defined

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to include manufacturers, importers, distributors and retailers) and consumers. EPR aims to ensure that the external costs associated with products throughout their lifecycle (including final disposal) are internalised in the costs faced by waste generators (e.g. in the market price of the product), and therefore to provide incentives to both producers and consumers to change their behaviour in ways that shift waste management up the waste hierarchy.

EPR is a policy concept, rather than a policy instrument; and can be implemented through a variety of regulatory, economic, and information-based policy instruments (Table 1) (Walls, 2006; Nnorom and Osibanjo, 2008). Furthermore, EPR can be implemented in a variety of ways, ranging from voluntary industry initiatives to mandatory regulations imposed by government (Widmer et al., 2005; Walls, 2006; Nnorom and Osibanjo, 2008).

This paper reviews the types of instruments available and their use in other countries, before focusing on their use in four packaging waste streams in South Africa, namely plastic bags, steel beverage cans, glass and polyethylene terephthalate (PET). Particular attention is paid to the effectiveness of voluntary as opposed to mandatory approaches in stimulating the recovery of post-consumer packaging material for recycling in the four streams.

2. International experience with EPR in the recycling market

The concept of extended producer responsibility was originally conceived and applied to the management of packaging waste in countries such as Sweden, Taiwan and Germany (the 1991 German Packaging Ordinance) in the late 1980s and early 1990s (Wilson, 1996; Walls, 2006). It has since been extended to the management of waste electrical and electronic equipment (WEEE; also known as e-waste) in the EU (through the 2002 EU WEEE directive), North America and East Asia; and to a range of other waste streams, such as used oil in Western Canada and vehicles in Japan (Widmer et al., 2005; Walls, 2006; Nnorom and Osibanjo, 2008).

EPR is traditionally implemented through either mandatory or voluntary product take-back schemes. Mandatory take-back obligations require that manufacturers, importers, distributors and/or retailers take products back at the end of their useful life, usually in combination with a recovery or recycling target, as in Germany, Austria and Taiwan. Alternatively, EPR schemes can be implemented voluntarily by industry as in the Netherlands, Victoria (Australia) and the UK (Wilson, 1996; Walls, 2006). However, even ‘voluntary’ approaches are often created by agreements arising out of a memorandum of understanding between the industry and government, often stemming from a desire by the industry to avoid the imposition of potentially harmful regulations (Widmer et al., 2005). Government sets a framework within which industry must act, or negotiates mutually agreed targets, and then gives producers the financial and physical responsibility to fulfill these obligations, and the freedom to find the most cost-effective way of doing so (Wilson, 1996). Thus, even ‘voluntary’ approaches are often born out of actual or potential government intervention.

In either case, Producer Responsibility Organisations (PROs) are often established as cooperative industry initiatives to collectively handle collection and arrange for recycling on behalf of the industry, so as to ensure that member companies are able to meet their EPR obligations (Widmer et al., 2005; Walls, 2006; Nnorom and Osibanjo, 2008). PROs are usually financed through fees paid by member companies (producers and/or users of packaging), per ton or unit of the packaging material or product (Walls, 2006). The purpose of PRO fees is to provide funding for the provision of incentives, subsidies, infrastructure and/or information to consumers, collectors and/or processors so as to increase supply of recyclables or recycled materials. Furthermore, the fees could encourage producers to reduce material use or packaging volumes, which would lead to a reduction in waste generation. Such fees are often passed on to consumers in the form of higher product prices, which should lead to a decline in demand from consumers, also leading to a decline in waste generation.

Germany's mandatory take-back scheme is often seen as a success story, with packaging volumes declining 4% between 1990 and 1999 (Walls, 2006), although it resulted in a surplus of collected packaging, which was dumped elsewhere in Europe, damaging voluntary recycling efforts there. By contrast, during the same period in the Netherlands, which relied on a purely voluntary program, packaging volumes increased 15–20% (Walls, 2006). However, in general, mandatory schemes are often seen as overly prescriptive, and therefore inflexible and costly; whereas firms who engage in voluntary schemes have incentives to develop innovative strategies to ensure that costs are minimised (Walls, 2006).

Both mandatory and voluntary take-back programs have been found to increase recycling, while PRO fees have been found to lower material use and packaging volumes (Walls, 2006). However, other types of policies which fall under the EPR umbrella, but which provide different incentive effects, can yield similar outcomes, often at a lower cost (Walls, 2006). For example, an advance recycling fee (ARF) is a tax assessed on product sales, revenues from which are often used to cover recycling costs (Walls, 2006; Nnorom and Osibanjo, 2008). ARFs “may be visible to the consumer... as a separate line item on the bill, similar to sales tax – or they can be assessed upstream on producers and later incorporated into the product price” (Walls, 2006, p. 3).

The incentives provided by an ARF depend largely on what is done with the revenues (Walls, 2006). For example, as with PRO fees, revenues from ARFs can be used to fund financial incentives (payments) to consumers, collectors or processors per unit or on a weight basis of material returned, collected or recycled, thus increasing the quantity supplied. This combined ARF/incentive system is essentially a type of deposit–refund scheme, where the ARF acts as a ‘deposit’ at the point of sale, while the payment acts as a refund that is paid upon return of the used product for recycling. Collection of fees and payment of incentives can be handled by a dedicated non-profit organisation (Wilson, 1996; Walls, 2006), essentially a PRO. For example, in western Canada, the oil industry devised and runs a program in which sales and imports of oil, oil containers and oil filters are subject to an ‘environmental handling charge’ collected by dedicated non-profit associations, which then pay collectors, transporters and processors for every container, filter or litre of oil reused or recycled (Walls, 2006). Legislation requires all sellers and importers to join the associations, and allows the associations to set the level of the environmental handling charge and the corresponding payment (Walls, 2006). Furthermore, collectors pass on a proportion of the payment they receive to

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<td>Take-back programs (mandatory or voluntary), including the provision of infrastructure; reuse and recycling targets; minimum product standards; prohibitions of certain hazardous materials or products; disposal bans; mandated recovery/recycling obligations</td>
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<td>Economic instruments</td>
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downstream consumers, thus providing incentives to consumers to return used oil, containers and filters to collectors (Walls, 2006).

According to Walls (2006), the combined ARF/incentive system may be more cost-effective than a mandatory take-back program. For example, in British Columbia, one of the provinces involved in the western Canada used oil program, the new ARF/incentive program was found to be far more effective than the previous mandatory take-back system, in which retailers were required to simply accept used oil from consumers at their own expense, leading to a lack of compliance by retailers (Walls, 2006).

3. The South African context for EPR

Developing countries have been far slower than developed countries in implementing EPR (Nnorom and Osibanjo, 2008). Some of the difficulties associated with implementing EPR in developing countries are as follows (Widmer et al., 2005; Nahman and Godfrey, 2008):

- consumers tend to re-use or dump products rather than recycle
- recycling is undertaken largely by the informal sector, making organised collection difficult to implement and posing risks to the environment and human health
- consumers are unwilling to return goods for recycling or pay for disposal of their waste
- lack of awareness among consumers and collectors of the environmental and health impacts associated with inappropriate waste handling and disposal, and of the benefits of recycling, including potential financial rewards
- lack of funding to finance recycling or even adequate waste management
- lack of safe and efficient infrastructure for recycling or appropriate waste management
- absence of waste management and recycling legislation/ regulations and/or enforcement
- lack of adequate capacity, skills and technology
- lack of reliable data for designing efficient waste management/recycling strategies and for making rational investment decisions

Nevertheless, in South Africa, national legislation has given government steadily increasing power to implement EPR. The National Environmental Management Act 107 of 1998 (Republic of South Africa, 1998, p. 12) states that “responsibility for the environmental health and safety consequences of a policy, programme, project, product, process, service or activity exists throughout its lifecycle.” Furthermore, the National Waste Management Strategy (Department of Environmental Affairs and Tourism, 1999) mentions EPR and product take-back legislation as priority areas for further investigation with a view to implementation in the near future; while EPR is one of the principles of the National Integrated Waste Management Bill (Republic of South Africa, 2003a). Most recently, the National Waste Management Bill (Republic of South Africa, 2007) and Waste Act (Republic of South Africa, 2008) explicitly create an environment in which EPR can be implemented. They allow the environment minister to establish national standards for EPR and to provide for the implementation of nationwide EPR policy measures, following proper consultation; while provincial authorities responsible for waste management may similarly implement EPR policy measures at a provincial level.

Government has targeted packaging waste as a priority waste stream for which EPR should be implemented. This had led in some cases to the promulgation of legislation (as in the case of plastic shopping bags); and, in other cases, to the signing of memorandums of understanding (MOUs) with industry (e.g. glass and PET, a type of plastic), and subsequently to the establishment of joint industry initiatives for dealing with EPR in these industries. In another case (steel beverage cans), an industry initiative was established in 1993, long before any mention was made of EPR in South African policy documents or legislation. The following section compares these different initiatives, focusing in particular on the effectiveness of voluntary schemes (e.g. cans, glass and PET) relative to mandatory legislation (e.g. plastic bags) in stimulating the recovery of post-consumer packaging materials for recycling.

4. Current EPR initiatives in the packaging industries in SA

4.1. Mandatory regulations: The case of plastic bags

In the late 1990s in South Africa, plastic shopping bag litter was so ubiquitous that these bags became known as the ‘new national flower.’ Plastic bags were distributed free of charge, providing little incentive for re-use or recycling, and instead encouraging over-consumption and littering. The bags were light in weight and highly contaminated with printing, and composed of thin plastic film, leading to high collection and processing costs, and limiting the range of potential end-uses. Recycling was therefore not viable or cost-effective, while the thin plastic film of which the bags were made had little commercial value as a raw material. Recycling rates of plastic bags were therefore less than 1% (Fridge, 2001).

The government’s response was to impose legislation in May 2003 (Republic of South Africa, 2003b) with respect to the thickness of and printing on plastic bags manufactured and imported. Specifically, it imposed a minimum thickness of 30 μm (effectively 24 μm, since 20% leeway was allowed for the first five years), and a limit to the amount of printing allowed. At the same time, a mandatory levy of 3c per bag was imposed on plastic bag manufacturers and importers.

The legislation has a number of intended purposes. Firstly, the regulations on bag thickness (which in turn impacts on weight) and printing increase the range of potential end-uses of recycled plastic bags and lower collection and processing costs, increasing the viability and cost-effectiveness of plastic bag recycling. The memorandum of agreement between government and the plastic bag industry (Republic of South Africa, 2002), which gave rise to the legislation, also recognises the need for a minimum percentage reprocessed polymer content in potential end-products, such as garbage bags and binliners, which should stimulate demand for re-processed polymer.

Secondly, the levy on plastic bags manufactured or imported increases the cost of manufacturing or importing plastic bags. This levy, essentially an advance recycling fee, is passed on to consumers through a voluntary agreement to charge them for plastic shopping bags at the point of purchase in the form of a plastic bag tax. This tax, which appears as a separate line item on the bill, aims to decrease consumers’ demand for plastic bags and encourages re-use among consumers, reducing material use and the generation of plastic bag waste. Since there is now a price attached to the bags, consumers are less likely to either dump or dispose of them.

The third aim of the legislation is to stimulate a plastic bag recycling industry by promoting the return and collection of used plastic bags, and to create employment, through the establishment of a ‘Section 21’ (non-profit) company, Buyisa-e-bag, which is a joint venture between government, labour and the private sector that is funded by the plastic bag levy. The aim of this company is to increase the convenience of, and thereby to reduce the costs associated with, the return and collection of used plastic bags, thereby increasing

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1 100c = 1 South African Rand (R); $1 = R7.32; €1 = R11.40. The finance minister has raised this to 4c per bag in the most recent budget speech (Manuel, 2009).
supply from consumers and collectors. For example, the company aims to establish strategically located Multi Recycling Buy-Back Centres to increase the convenience of returning used bags. Furthermore, collectors are able to sell used plastic bags to these centres, thereby increasing their supply (Buyisa-e-bag, 2008).

However, while the legislation has arguably been effective in reducing plastic bag production and waste, it has been far less successful in terms of creating a viable plastic bag recycling industry and associated employment. According to one media report in 2006, “consumers [had] forked out more than R100-million to the government from the compulsory plastic bag tax… but to date not a single bag [had] been recycled from this lucrative fund” (Gosling, 2006). Nor had any recycling depots been established or jobs created in the recycling industry. Indeed, with the decline in demand for plastic bags and therefore job losses in the plastic bag manufacturing industry, the net effect may have been a decline in overall employment (Gosling, 2006; Packaging Council of South Africa, 2006).

According to the Packaging Council of South Africa (PCSA) and various reports in the media, a plastic bag recycling industry has not developed because insufficient funds from the plastic bag levy are distributed to Buyisa-e-Bag, with the bulk of the revenues ending up in government coffers (Gosling, 2006; Packaging Council of South Africa, 2006). The plastic bag levy is paid to the South African Revenue Service; thereafter funds are transferred via the Department of Environmental Affairs and Tourism (DEAT) to Buyisa based on the submission of an annual business plan (highlighting recycling and awareness-raising projects and programs to be carried out over the next three years, and their associated budget) to DEAT. Based on these business plans, DEAT requests funding for Buyisa from the National Treasury (Buyisa-e-bag, 2008).

For the year ending February 2006, R90 million was collected in levies (3000 million bags × 3c per bag); of which only R20 million (22%) was allocated to DEAT, of which only R12 million (13% of revenues collected) was paid to Buyisa, of which R5.4 million had to be paid to the South African Bureau of Standards for enforcing the plastic bag minimum thickness regulations, leaving only R6.6 million (7% of revenues collected) for Buyisa’s activities (Packaging Council of South Africa, 2006). According to the PCSA (2006, p. 3), “this level of earmarking is unacceptably low and a substantially higher proportion – in excess of 35% – should be allocated to Buyisa-e-Bag for their activities.” However, the National Treasury does not allow tax revenues to be earmarked for a specific purpose, since this reduces transparency and increases the scope for special interest groups to capture revenue (Nahman and Godfrey, 2008). It is for this reason that DEAT has to apply to Treasury for recycling funds on behalf of Buyisa. Although this is in line with international best practice regarding sound fiscal management, the result is that Buyisa receives insufficient funds for recycling and job creation. However, according to the Treasury (Morden, 2007), the problem is not that the funds are not earmarked, but that Treasury simply has not received requests from DEAT to release the funds; presumably because the business plans submitted to DEAT by Buyisa have not been adequate.

Another reason why the legislation has failed to stimulate recycling and employment is the decline in plastic bag sales and increase in reuse (particularly for bin liners) resulting from the plastic bag tax. At one point, when consumers were paying 46c per bag, sales seemed to have fallen to such an extent (to 10% of previous levels) that there were no longer enough plastic bags in circulation to ensure a viable recycling industry (Packaging Council of South Africa, 2006). Furthermore, such a decline in sales implies a decline in tax revenues, such that less money is available for Buyisa-e-Bag to undertake its activities.

However, this dramatic decline in sales was short-lived. The price of plastic bags was lowered to 32c in August 2003, follow-
lished a world-class de-tinning plant in Vanderbijlpark, where the tin is stripped from the steel cans, allowing the separated steel to be recycled more cost-effectively, which has seen demand increase. In addition, ArcelorMittal, the major steel producer, has signed an agreement to accept the cans to mix with other scrap for the production of mild steel as part of its commitment to EPR (Collect-a-Can, 2008b). Indeed, shareholder commitment is crucial to the success of the model. Such commitment is more likely to be secured through a voluntary industry initiative than through government-imposed regulations, highlighting one of the benefits of voluntary industry initiatives.

Finally, although Collect-a-Can does not provide permanent employment for collectors, they are able to earn or supplement an income from selling used cans to Collect-a-Can. Furthermore, Collect-a-Can encourages and assists these collectors to start up entrepreneurial recovery and recycling operations (Collect-a-Can, 2008a). Collect-a-Can is therefore often cited as “a good example of how the industry can develop a sustainable effort to meet its responsibilities to the environment and in the process, alleviate the plight of the poor” (Collect-a-Can, 2008a) and “a model to which other industries should aspire” (BuA News, 2003).

4.2.2. The Glass Recycling Company

Although glass is infinitely recyclable, prior to 2006, glass recovery rates in SA were relatively low (around 20%) compared to other countries due to a lack of industry ownership and responsibility (The Glass Recycling Company, 2007, p. 8). However, government’s focus on the packaging industry, which resulted in legislation on plastic bags, for example, motivated the glass industry to coordinate its efforts and embrace the concept of EPR (The Glass Recycling Company, 2007). This led to the establishment of the Glass Recycling Company (GRC) in 2006. This non-profit, joint industry initiative was established through a nationwide partnership between government (DEAT); glass manufacturers; fillers, who use glass to package their products; and recyclers. It is motivated by the desire to avoid punitive legislation of the plastic bag type, and has signed a MOU with DEAT to increase the recovery rate of glass (Consol Glass, 2008).

The GRC is a PRO that is “responsible for facilitating the recovery of waste glass for recycling” (Consol Glass, 2008) on behalf of the glass industry. Unlike Collect-a-Can, however, the GRC does not partake in the physical recycling process (The Glass Recycling Company, 2008). Instead, recycling is carried out on-site by South Africa’s major glass producers, Consol Glass and Nampak Weigand Glass. The GRC simply facilitates glass recovery by promoting glass recycling, raising awareness regarding its importance, and building capacity (Brink, 2007; The Glass Recycling Company, 2008). It aims to “foster a robust collecting industry” (Brink, 2007, p. 112) by providing collection infrastructure (such as glass banks where consumers can take used glass for recycling) and payments to collectors, thereby ensuring a reliable supply of waste glass. Through an agreement with glass manufacturers, it also guarantees a demand for waste glass.

Prior to the establishment of the GRC, financial resources for promoting glass recovery and recycling (including marketing and capacity building) were lacking (The Glass Recycling Company, 2007). The GRC has adopted what it calls an advanced repurchase model, whereby provision is made for dealing with waste glass at the end of its useful life at the point of manufacturing (Goldwyer, 2007). This model essentially amounts to a combined advance recycling fee/incentive system. Member companies (fillers) pay a levy at the point of purchase (essentially a PRO fee) per ton of glass bottles purchased from glass manufacturers Consol and Nampak (Rhodes, 2007; The Glass Recycling Company, 2007).

The levy is used to cover costs as well as to raise funds for the provision of information (in the form of education, marketing and awareness campaigns), basic collection infrastructure (e.g. glass banks) and financial incentives (in the form of payments to collectors); in order to ensure a reliable supply of used glass from both consumers and collectors. By providing glass banks at strategic locations around the country (The Glass Recycling Company, 2008), the GRC lowers the cost to consumers of returning waste glass, thereby increasing their supply. Furthermore, consumers can get cash for glass if they take their glass to scrap dealers, entrepreneurs or buy-back centres (established by glass manufacturers such as Consol), rather than GRC glass banks (Consol Glass, 2008), thus increasing the quantity supplied.

Prior to the establishment of the GRC, there was a perception among potential collectors that the prices paid for waste glass were too low, or a lack of awareness that waste glass had a monetary value at all (The Glass Recycling Company, 2007, 2008). The quantity supplied by collectors was therefore low. The GRC aims to increase this supply by setting up entrepreneurs who pay collectors for the waste glass that they collect (The Glass Recycling Company, 2008). In turn, entrepreneurs sell the waste glass to manufacturers, who have signed an agreement to pay prices equivalent to that of virgin batch material (Brink, 2007). This guarantees a stable price for collected glass that is not subject to market fluctuations (The Glass Recycling Company, 2008), ensuring a reliable supply from collectors and entrepreneurs. This agreement also guarantees a reliable demand for used glass.

The GRC relies entirely on levy payments as its only source of income. Thus, as with Collect-a-Can, shareholder commitment is crucial to the success of the model. The GRC’s shareholders include the major manufacturers and 90% of fillers, making it “a more comprehensive industry-wide initiative than Collect-a-Can” (Brink, 2007, p. 112). Furthermore, the GRC benefits from 100% levy compliance (The Glass Recycling Company, 2007, p. 12). This level of commitment from industry has resulted in substantial increases in collection, recycling and re-use rates of used glass (The Glass Recycling Company, 2007). In its first year of operation, the recovery rate of waste glass increased from 21% (in 2005/2006) to 26% (in 2006/2007) of glass containers produced in SA (The Glass Recycling Company, 2007). Like Collect-a-Can, the GRC also contributes to job creation by providing a stable source of income for unemployed collectors, and by allowing for entrepreneurs to be set up (The Glass Recycling Company, 2008).

4.2.3. PETCO

Like steel and glass, PET, a type of plastic resin commonly used for beverage and food containers, such as cool drink and mineral water bottles, is 100% recyclable. The recovered polymer can be used in a wide variety of applications. However, a number of potential end-uses, such as ‘bottle-to-bottle’ recycling, which would ‘close the loop’ in terms of the PET life-cycle completely, require both fairly advanced technology and recycled PET of an extremely high quality. Prior to 2000, only 2% of PET bottles used in South Africa were collected for recycling, all from landfill sites and therefore severely contaminated; pushing up the operational costs of producing recycled products of sufficient quality for food contact purposes and limiting the potential end-uses of recycled PET (Brink, 2007). Thus, PET collected for recycling was both of insufficient quantity and quality for a viable PET recycling industry. However, given that PET is 100% recyclable and amenable to numerous end-uses, the PET industry realised that it could exploit

2 Indeed, Consol Glass have shown their commitment to continue purchasing waste glass into the foreseeable future by investing in sorting and recycling technology to the extent that “the company now has a sustainable model that is already revealing a reduction in the overall cost of glass recycling as volumes start to increase” (Goldwyer, 2007).
this latent demand if it could ensure a cost-effective supply of PET of a sufficient quantity and quality, and therefore that it could benefit from an industry-regulated and coordinated recycling initiative (Brink, 2007).

In addition, like the can and glass industries, the PET industry wished to avoid punitive government legislation of the type imposed on the plastic bag industry (PETCO, 2006). Manufacturers and downstream industries came to the conclusion that collectively addressing their responsibilities with respect to post-consumer PET packaging in the waste stream through an industry-driven and financed national recycling initiative based on the concept of EPR would be more effective and efficient than government-imposed regulation (PETCO, 2006; Brink, 2007). Thus, following a 1999 meeting of representatives from the PET industry (including Coca-Cola, resin producers, converters and bottlers) and the formation of the PET committee, South African Polyester Recyclers was established in 2000 as an industry-run recycling operation. This was followed by the establishment of PETCO at the end of 2004 as a not-for-profit, joint industry initiative to capitalise on the expected growth in the market for recycled PET and to act as the vehicle through which the PET industry would self-regulate and coordinate its recycling activities (Brink, 2007).

Like the GRC, PETCO is not involved in the physical recycling process itself (Brink, 2007). Instead, it acts as a PRO that undertakes activities related to EPR, such as promoting and advancing the collection and recycling of post-consumer PET, on behalf of its shareholders in the PET industry, namely brand-owners (such as Coca-Cola), resin producers, converters (who manufacture bottles from PET resin) and bottlers (fillers) (PETCO, 2006). It has signed a MOU with DEAT whereby the latter agrees not to promulgate legislation relating to PET recycling (as it has in the plastic bag case) provided that the industry, through PETCO, takes responsibility for its post-consumer waste (PET collection and recycling) “according to mutually agreed upon targets, evaluation and monitoring processes” (PETCO, 2008a).

The market price of PET fluctuates as a result of fluctuations in oil prices, exchange rates, demand from large countries such as China, and other factors (Brink, 2007). In addition, the market for scrap plastics, particularly for a non-traditional waste stream such as PET, is immature and vulnerable to numerous information-related and technical imperfections and failures. Prices in this market are therefore particularly volatile (Stromberg, 2004). Despite this, and despite the fact that neither the technology nor the quality of recycled PET is currently sufficient to allow for bottle-to-bottle recycling or other food-contact applications, the multitude of other end-use applications implies that demand for recycled PET is already sufficiently high. However, before the establishment of PETCO, supply of used and recycled PET was not able to keep pace with this demand, and was highly unstable as a result of volatile prices (Brink, 2007).

Like the GRC, PETCO has adopted a business model which essentially amounts to a combined advance recycling fee/incentive system, which aims to stabilise prices, and therefore supply. A key component of the model is a voluntary levy (essentially a PRO fee) paid by converters (who manufacture PET bottles from polyester resin) and bottlers (who fill PET bottles) per ton of PET resin purchased (currently set at R200/ton) from resin producers. The levy is also paid by PET importers; while resin producers (who collect the levies on behalf of PETCO) and brand owners (such as Coca Cola) contribute in the form of annual grants. The revenue from these levies and grants is used to finance operational costs (PETCO, 2005), and to ensure a constant supply of used and recycled PET through adverse economic conditions (PETCO, 2008a).

PETCO uses the revenues to support recyclers (particularly during adverse economic cycles, when prices are unfavourable) and recycling projects, as well as to support companies promoting PET recycling and to fund education and awareness-raising programs, in order to increase the supply of recycled PET. This support takes the form of subsidies per ton of material recycled, financial support for recycling operations and infrastructure, transport subsidies, and/or a safety net during adverse economic cycles. PETCO keeps the price of recycled PET artificially high when market conditions are unfavourable, ensuring that recyclers are kept in the market despite fluctuations (PETCO, 2005; Brink, 2007). This stabilises the price paid to processors at an attractive level, ensuring a reliable supply of recycled PET. In turn, recyclers pay collectors per ton of used PET collected, at prices that are based on the prices recyclers themselves receive from PETCO, such that collectors are also kept in the market during adverse cycles (PETCO, 2005; Brink, 2007). Again, this attaches a stable monetary value to each unit of PET collected, therefore increasing the quantity of used PET supplied by collectors.

Through the collective actions of the PET industry since 1999, including the establishment of PETCO in 2004, PET recycling in SA has grown from 2% of PET produced in 2000 to 17% of PET produced (including 24% of beverage bottles) in 2007 (PETCO, 2008b). Like Collect-a-Can and the GRC, PETCO also contributes to job creation, by providing support to collectors and recyclers. The PET case thus represents another “successful example of an industry working together to address its post-consumer responsibility by removing a 100%-recyclable product from the national waste stream” (Brink, 2007, p. 110); and, like the can and glass cases, highlights the positive spin-offs for both business and society of voluntary industry initiatives (Brink, 2007).

5. Synthesis and lessons learned

South Africa’s plastic bag legislation reflects an intention on the part of government to force producers and consumers to change their behaviour (Brink, 2007). Under this type of approach, government imposes extended producer responsibility on an industry, compelling industry to take its post-consumer liability seriously or face some type of penalty (Brink, 2007). However, this approach has not yet been able to create a viable recycling industry for plastic bags in South Africa (Brink, 2007).

By contrast, other models in the packaging industry in SA, relating to cans, glass, and PET, highlight the potential benefits of voluntary industry initiatives (Brink, 2007). Although these models have important differences, they are all essentially examples of voluntary EPR initiatives based on the establishment of a producer responsibility organisation that coordinates the industry’s EPR activities and ensures that its responsibilities are met. For example, in all cases, the respective PRO aims to promote recycling and to stimulate recovery by providing incentives and infrastructure for collection; although Collect-a-Can differs from the other initiatives in that it is also involved in the physical recycling process (Brink, 2007). In the case of glass and PET, recycling is undertaken by large manufacturers, and, in the case of PET, by another joint industry initiative, South African Polyester Recyclers.

Furthermore, while Collect-a-Can was established and is funded exclusively by two shareholders, SA’s largest steel company and its largest beverage can producer; both GRC and PETCO have numerous shareholders across their respective value chains, and are funded by levies paid by member companies based on product sales. However, in the case of the GRC, the levy is paid only by fillers on finished glass containers purchased from glass manufacturers, whereas in the PETCO case, levies are paid by PET converters (on resin purchased from PET resin manufacturers) and importers as well as bottlers (on bottles purchased from converters); while resin producers and brand owners pay annual grants. However, in all cases, shareholder commitment is crucial to the success of the models,
and in all three cases shareholder commitment has proved to be effective.

South Africa’s experience with EPR in the packaging industries therefore shows that voluntary industry initiatives (as in the can, glass and PET industries) can be effective in stimulating recovery in a developing country context. By contrast, in the South African case, mandatory, government-imposed regulations (as in the plastic bag industry) do not seem to have been effective in stimulating recovery. This can be illustrated by showing how recovery rates have increased as a result of the implementation of EPR in each of the respective industries (Fig. 1). This shows that in the case of cans, glass, and PET, recovery rates began to increase significantly in the year or the year after the respective industry initiatives began; whereas in the case of plastic bags, recovery rates remained low even after the regulations were promulgated.3

This seems to imply that industry initiatives are more effective than government regulation in stimulating the recovery of packaging waste for recycling. For example, in its critique of the plastic bag legislation, the Packaging Council of South Africa (2006, p. 3) argues that “an industry driven environmental solution – as per a number of initiatives between [other] sectors of the packaging industry and DEAT – is a far more efficient and effective method of dealing with the issue of packaging in the waste stream.”

However, the findings of this paper do not imply that voluntary initiatives are always and everywhere more effective than mandatory regulations. Instead, it is likely that the differing results for plastic bags as opposed to other packaging waste streams in South Africa can be explained by the differing characteristics of the former that make them less amenable to recycling. For example, their usefulness for re-use applications, particularly as bin liners, means that they are difficult to recover and recycle. Furthermore, their lower weight and value per unit, and the relative lack of post-recycling applications, implies that they have a low recycling value relative to the other waste streams.

In addition, in the case of glass and PET, it could be argued that the initiatives were not entirely ‘voluntary.’ In both cases, MOUs were signed with government, who are partners in the respective organisations, giving the industries freedom to find the most cost-effective way of meeting the mutually agreed upon targets. Furthermore, in both cases, a major incentive behind the voluntary initiatives was the desire to avoid punitive regulations like those imposed in the plastic bag industry. Thus, the mandatory plastic bag regulations actually provided a raison d’être for ‘voluntary’ initiatives in the glass and PET sectors. Thus, government intervention in the plastic bag industry was not only fairly successful in changing consumer behaviour regarding plastic bags; it may also have had the indirect effect of stimulating recovery by changing producer behaviour in the glass and PET industries.

Acknowledgements

This study was funded by the CSIR through the Parliamentary Grant budget. Les Venter, Roelf de Beer (both Pikitup), Linda Godfrey and Suzan Oelofse (both CSIR) contributed to the initial thinking. Willem de Lange (CSIR) and two anonymous reviewers provided useful insights and comments on an early draft.

References


Fig. 1. Recovery rates over time in SA for cans, glass, PET and plastic bags.
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