PLASTIC BAGS: NATIONAL POLICIES & PRACTICES

2011

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ACR+

FOREWORD

This report - **Plastic Bags: National Policies & Practices 2011** - was commissioned by **PlasticsEurope**, as a new (2011) edition of the report first published by the Association of Cities and Regions for Recycling and sustainable Resource management (**ACR+**) in 2008. Both editions were written by Kit Strange of ACR+.

PlasticsEurope commissioned this 2011 in-depth review of the policies and practices currently implemented around the world in order to provide a clear overview not only of the various policy options and voluntary initiatives in place to address the litter issue, and their effectiveness, but also, importantly, to provide an insight into the factors and the arguments influencing the choice of one option over another.

PlasticsEurope is one of the leading European trade associations and represents the interests of Europe's plastics manufacturers. It networks with European and national plastics associations and has more than one hundred member companies, producing over 90% of polymers across the 27 EU Member States as well as Norway, Switzerland, Croatia and Turkey. PlasticsEurope has developed close partnerships with sister associations which represent the European plastics manufacturing chain, including more than 50,000 converters and over 1,000 machinery manufacturers. In addition to its Brussels headquarters, PlasticsEurope has regional offices located in Frankfurt, London, Madrid, Milan and Paris.

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ACR+ is not presently advocating any specific political measure concerning waste plastics. But ACR+ considers that waste, be it plastic or other, presents an environmental challenge. This needs to be addressed with a European strategy implementing the new waste hierarchy. In relation to the specific debate about plastic bags, ACR+ has been working first to clarify the range of political instruments available, and this was exactly the aim of its 2008 publication.

ACR+ (the Association of Cities and Regions for Recycling and sustainable Resource management) is an international network of members who share the common aim of promoting the sustainable consumption of resources and management of waste through prevention at source, reuse and recycling. ACR+ currently has around one hundred members, mainly local and regional authorities as well as national networks of local authorities representing around 1,100 municipalities.

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EXECUTIVE SUMMARY

This report describes the issues associated with the lightweight thin-walled plastic carrier bag, which has become a commonplace adjunct to modern shopping. The plastic bag is now often taken to serve in an iconic role, a proxy for modern consumerism.

Plastic bags can be found in virtually every shop or supermarket on earth. They are lightweight, cheap, durable and provide excellent functionality for their main purpose: carrying purchases between shop and home. They can also carry colourful images and brand identities, and serve as useful forms of advertising. For more than half a century, customers have been happy to use these serviceable items.

Arguments supporting further use reduction

- to change attitudes towards resource use, moving from a 'throwaway' society to more sustainable lifestyles
- alternatives are readily available
- possible environmental benefits of long-life bags (including plastic bags) compared to thin-walled bags
- to reduce littering and associated social impacts
- to reduce other impacts, such as possible effects on infrastructure (e.g. blocked drains), or ingestion by wildlife
- to respond to public pressure for action against plastic bags
- to improve waste management by focusing on prevention and re-use, rather than options further down the waste hierarchy (including recycling).

Arguments against further use reduction

- when reused, thin plastic bags have a better environmental performance than alternatives when using a life cycle approach
- some alternatives are less hygienic and not waterproof
- thin-walled bags can be (and are) re-used
- thin-walled bags are fully recyclable
- plastic bags are made from a by-product of oil refining and use resources that would otherwise be thrown away
- action taken to reduce plastic bag use can have negative environmental consequences, in particular when it comes to litter
- plastic bags have a high calorific value which can be captured in energy recovery plants
- shoplifting may be easier when many people carry their own reusable bags.

In many industrialised countries the real impact of plastic bags is limited to litter nuisances due to their visibility and easy dispersal. However, just as many people happily report that their own pro-environmental behaviours include reducing their use of plastic bags, so there is a widespread public enthusiasm for policy actions against these tokens of consumerism.

It is often argued that the environmental gains achieved through a reduction in the consumption of plastic bags could be reduced or offset by the environmental impacts of increased use of plastic bag alternatives (such as bin liners).

The choices facing policy-makers are therefore diverse, not particularly clear-cut and depend on a web of inter-connected factors. As with most policy decisions, national, regional and local administrations can act at different pressure points. In democratic systems, decisions are usually reached after assimilating views of relevant stakeholders. For plastic bags, policy decisions range between doing nothing beyond token gestures (for example a supermarket offering eco-points to customers who bring their own bags) to the extreme and

comprehensive measure of legislated prohibition. Between these extremes, one finds an array of more or less persuasive measures which can yield the varying results described within this report.

Bans are often applied to non-biodegradable lightweight, thin-walled plastic carrier bags, with some administrations being more fussy about the nature of the biodegradability (for example extending bans to bags which are less than fully compliant with authorised national compostability standards). Bans usually specify a minimum gauge or thickness, ensuring that heavier, more durable (and therefore more likely to be reused) bags are permitted. Prohibitive legislation is more likely to be applied in poorer countries (typically with an annual per capita GDP of US$10,000 or less), where plastic bags and other waste items can clog drains and sewers, with consequential risks for public health and the environment.

Taxes and charges are sometimes accompanied by a threat of a ban in the event that particular targets for bag use reduction are not met. These charges may be applied in tandem with voluntary agreements by industry to reduce bag consumption. Sometimes, effective voluntary action by retailers can forestall the need for mandatory legislative interventions.

Of course, systems of charging can serve both to elicit a behavioural change in consumers, but can also generate funds with the option (although this ought to be systematic) to allocate these to environmental causes.

At the lower end in terms of complexity and reduction potential, policymakers and industry can focus their attention on increasing recycling rates for plastic bags; this is a simple application of existing producer responsibility systems which acknowledges that a plastic bag can be viewed as a sub-set of packaging.

The easiest initiative (in terms of reducing the use of plastic bags) would be to rely on retailers' own in-house efforts to offer incentives to those customers who decline to use available free bags. Bonus points awarded to stores' loyalty card schemes would be one example, another would be the free replacement of thin-walled bags with heavier reusable carrier bags.

There are many local campaigns against plastic bags, organised by local authorities or campaigning groups. These campaigns are too numerous to document within this report. However, these local initiatives are interesting in their own right. They can exert upward pressure for change through retailers, local and national authorities. In these cases, although global issues are often referenced by campaigners soliciting local participation, prime local drivers relate more to litter problems.

Regardless of whether measures to limit dependency on lightweight thin-walled plastic carrier bags are implemented by 'top-down' policies, or by 'bottom-up' grassroots initiatives, there is a connection between these symbolic behavioural changes and other more important issues connected with resource use, environmental impacts and sustainable consumption and production.

INTRODUCTION

WHAT IS A PLASTIC BAG?

Before analysing the various issues related to plastic bags in more depth, one needs to address the question of whether there is a common understanding of what is meant by a plastic bag. Bags, plastic or other, are often described as 'service packaging', i.e. packaging not connected to a specific product and/or not sold with the product, However, under this category it is important to make a further distinction for better definition and understanding:

1. Carrier bags, the primary function of which is to transport goods from one place to another and which are often provided at the counter of a shop or supermarket
2. Bags in which to put loose fruit and vegetables etc. sold in the supermarket and which would then typically be placed within a carrier bag once at the counter (used in open-air markets as well).

When the media and the public talk about plastic bags, they are usually referring to 'carrier bags' distributed at the counter of a shop or supermarket.

TYPES OF CARRIER BAGS AVAILABLE ON THE MARKET

Table 1. Key features of carrier bags (Source: Scottish Government)[1]

Bag type	Features	Average weight per thousand bags (kg)
Paper, no handles	Convenient	51
Non-woven polypropylene	Durable, strong and effective when wet	138.7
Woven polypropylene		226
Lightweight plastic carrier		8.4
'Bag for life'		47.4
Fully degradable plastic bag		6.5
Paper, with handles	More appealing to customers eg for shoes and clothes	124

WHAT IS MEANT BY REUSABLE, SINGLE USE OR THROW-AWAY BAGS?

There is a globally accepted improper use of the terms 'single use' or 'throwaway'. Indeed, references to 'single use' or 'throwaway' bags are not made because such bags have been produced or designed in order to be used only once, but rather, because the general perception is that consumers use them only once for their original purpose, namely for carrying goods home from the shop or supermarket.

Although what is most commonly understood by a reusable plastic bag is the thick-walled bag, research has shown that thin-walled carrier bags, or so-called single use or throwaway bags, are also very often reused, for example as bin liners.

In view of the above, and in order to acknowledge the actual uses of the various types of plastic bags, this report will make reference to thin-walled or thick-walled plastic bags only.

EVOLUTION OF THE LIGHTWEIGHT SUPERMARKET PLASTIC BAG

The first use of plastics for lightweight, thin-walled bags started in the 1950s and by 1958 polyethylene bags were starting to compete with paper alternatives in dry-cleaning laundries.[2] Within a decade, plastic bags were used for almost one-third of bread packaging, and by the mid-1970s US retailing giants (such as Sears and J.C. Penney) had all switched to plastic bags.

In 1990, consumer plastic bag recycling began through a US supermarket collection-site network, and within two years nearly half of American supermarkets had made available in-store collection schemes for recycling plastic bags. By 1996, four out of five grocery bags in America used were plastic.

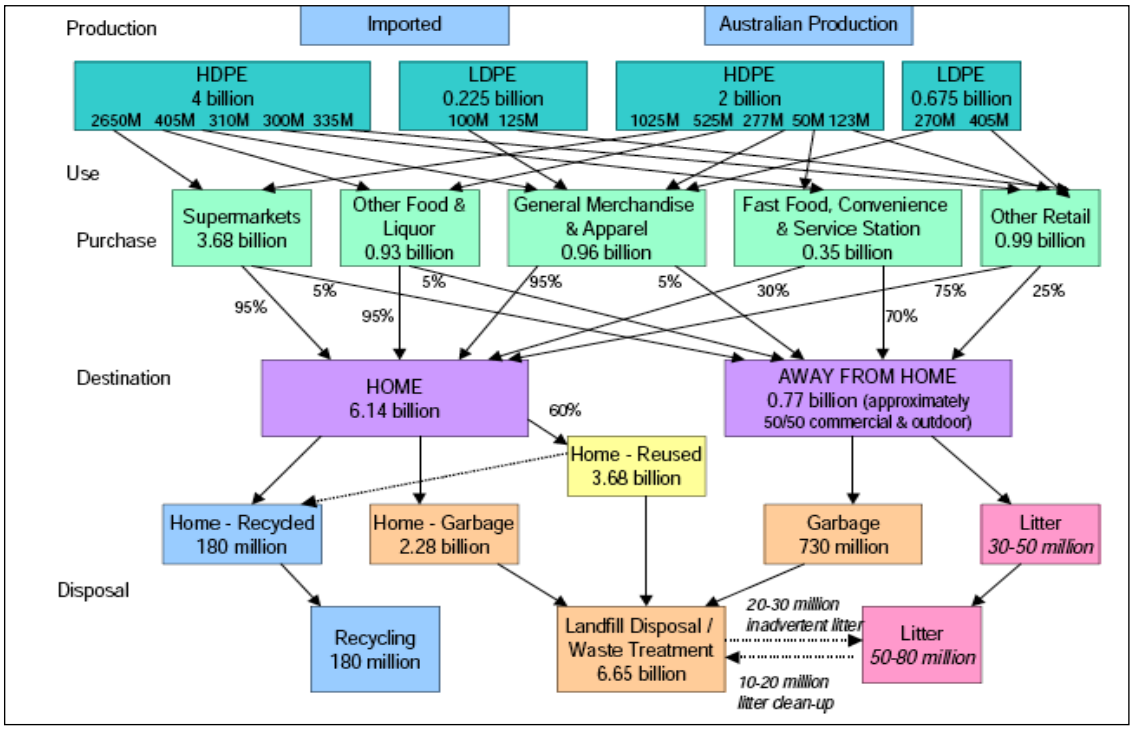
TYPICAL PLASTIC BAG FLOWS THROUGH SOCIETY

Although circumstances vary widely from country to country, perhaps the most comprehensive suite of lifecycle flow measurements has been undertaken in Australia, by Nolan-ITU (2002)[3].

Figure 1 (overleaf) demonstrates the main flows of plastic bags through the Australian economy. A small but significant proportion (perhaps one per cent) ends up as litter.

In other countries, among the disposal options for plastic bags, there is also the option to recover energy from plastic bags entering the waste stream in energy recovery plants.

Figure 1. Summary of plastic bag flows in Australia



Source: Nolan-ITU (2002).[3]

WHY FOCUS ON PLASTIC BAGS?

The main reasons for the disproportionate level of interest in this product stream can be attributed to the fact that plastic bags are ubiquitous, often free of charge, visually intrusive, persistent and frequently excluded from recycling schemes.

PLASTIC BAGS END UP IN THE ENVIRONMENT

According to the European Commission[4], marine litter consists of items that have been deliberately or carelessly discarded, unintentionally lost, or transported by winds and rivers, into the sea and on beaches. Many marine species such as seals, whales and marine turtles become entangled in marine litter, causing suffocation, strangulation and drowning. Another serious problem affecting many species of whales, birds and fish is the ingestion of marine debris, particularly plastics. With over 80% of marine litter coming from land, the global move has been to focus attention on preventing litter at its source. However, it is clear that the increase in marine litter is not only a question of poor waste management practices, but more importantly, it is due to a lack of public awareness as to the consequences of irresponsible disposal of packaging such as plastic bags.

PLASTIC BAGS AND WASTE PREVENTION

To many people, the plastic bag is a symbol of a consumer-driven society, a product with a short lifespan, a lifespan (sometimes counted only in minutes), and attempts to reduce the use of plastic bags could potentially be seen as a drive to reduce consumption. Waste prevention is increasingly becoming a priority and is placed up high on the sustainability agendas both at EU level and worldwide.

Research (eg Brook Lyndhurst, 2009[5]) suggests that the public is confused about the meaning of waste prevention. However, one activity often viewed by householders as a contribution to effective waste

prevention is their choice to refrain from using plastic shopping bags. The fact is that putting in place high profile measures for such a small portion of the waste stream risks sending the wrong environmental message, as consumers end up believing they really are 'doing their bit' for waste prevention, while other behavioural changes would have a far greater positive impact.

Nevertheless, in a major review carried out for the UK Government, consultants Brook Lyndhurst (2009)[6] reported emerging evidence that communications on issues such as carrier bags (or junk mail) could be an effective 'hook' to engage householders in the idea of waste prevention. This is not to say that these behavioural changes can deliver major environmental or sustainability improvements in themselves, but they can trigger other, further-reaching, shifts with greater benefits.

There are quick wins in choosing options such as reductions in junk mail and plastic bags (supported by voluntary agreements), both of which are popular with the public and relatively straightforward to implement. Since the tonnage impact may not be that important (especially with regards to the bags) it is important to maximise the 'foot in the door' effect of such initiatives on efforts to educate the general public on the larger impact activities. This will be especially true for local waste prevention campaigns.

PLASTIC BAGS HAVE ENVIRONMENTAL IMPACTS

Plastic bags have numerous advantages, the most important being that their design and function are ideal for their purpose, and unsurprisingly, this makes them very popular both with consumers and retailers. However, the global production counted in billions each year, coupled with their low price, low density (140,000 bags can weight less than a tonne) and high visibility means that they also have an impact on the environment. Due to the sheer number put on the market, even if only one per cent of thin-walled plastic bags become litter per year, this can comprise millions of bags in a typical country.

There have been various detailed reports on the impact of carrier bags on the environment, with the most recent one being that published by the UK Environment Agency[7].
The report *Life Cycle Assessment of Supermarket Carrier Bags* was commissioned by the UK Government, and undertaken by Intertek Expert Services. It was part of an overall study they were carrying out on how to reduce the environmental impact of retail and food packaging.

The following types of carrier bag were studied:

- a conventional, lightweight carrier made from high-density polyethylene (HDPE)
- a lightweight HDPE carrier with an additive to break the down the plastic into smaller pieces
- a biodegradable carrier made from a starch-polyester (biopolymer) blend
- a paper carrier
- a 'bag for life' made from low-density polyethylene (LDPE)
- a heavier durable bag, often with stiffening inserts made from non-woven polypropylene (PP)
- a cotton bag.

The study found that:

- the environmental impact of all types of carrier bag is dominated by resource use and production stages of the bags' lifecycles. Transport, secondary packaging and end-of-life management generally have a minimal influence on their performance.
- whatever type of bag is used, the key to reducing impacts is to reuse it as many times as possible and where reuse for shopping is not practicable, other reuse, e.g. to replace bin liners, is beneficial.
- the reuse of conventional HDPE and other lightweight carrier bags for shopping and/or as bin-liners is pivotal to their environmental performance and reusing the bags as bin liners produces greater benefits than recycling them.
- starch-polyester blend bags have a higher global warming potential and abiotic[1] depletion than

[1] *Abiotic resources include non-living things, such as land, water, air and ores.*

conventional polymer bags, due both to the increased weight of material in a bag and higher material production impacts.

- Paper, LDPE, non-woven PP and cotton bags should be reused at least 3, 4, 11 and 131 times respectively in order for them to have lower global warming potential than conventional HDPE carrier bags that are not reused.
- recycling or composting generally produce only a small reduction in global warming potential and abiotic depletion.

Importantly, in view of the ongoing debate at EU level, the report concludes that the HDPE bag has the lowest environmental impact among the thin-walled options in eight of the nine impact categories: global warming potential; abiotic depletion; acidification; eutrophication; human toxicity; fresh water aquatic ecotoxicity; marine aquatic ecotoxicity; terrestrial ecotoxicity; and photochemical oxidation.

PLASTIC BAGS: RESOURCE EFFICIENCY AND CARBON FOOTPRINT

Although thin-walled plastic bags have been criticised as being a wasteful use of resources compared to heavier gauge 'bags for life', the above-mentioned UK report reveals that such a judgement would be both simplistic and incorrect. Indeed the report shows that if a thin-walled plastic bag were to be used three times, a cotton 'bag for life' would need to be used as many as 400 times in order to tip the environmental balance in its favour.

Lightweight thin-walled carrier bags have the lowest carbon footprint per bag based primarily on resource use and production, while paper, thick-walled plastic and cotton bags all use more resources and energy in their production. However, a key issue is again how many times the bags are reused.

On the other hand, the popular plastic 'bags for life' (LDPE) provided by many supermarkets need to be used only four times to ensure they have a lower carbon footprint than thin-walled bags used only once. If used 11 times, premium, heavier weight 'bags for life' that look like fabric and are made from woven plastic will have a lower carbon impact than thin-walled bags.

Another study (2011)[8] on the carbon footprint of carrier bags in China, Hong Kong and India concludes that across the entire lifecycle the disposal phase has the greatest significance in terms of carbon footprint. The peculiarity of this phase of the life cycle is that end-of-life scenarios are mostly decided by consumer behaviour and governmental policies.

All the case studies showed that the more the reuse option was chosen, the lower the environmental impact. In one of the cases, it was found that with a mere 5% increase in reuse, around 20% of carbon footprint would be saved. Hence, the key is that consumers must reuse the bags until they can be discarded. Once they decide to discard, the other best option would to be to send the bag for recycling rather than disposing of it in landfills (N.B. the study did not take energy recovery into consideration).

Although the study was undertaken in Asia alone, it would be fair to say that on a global level, both consumer behaviour and governmental policies are pivotal in terms of encouraging people to go for reusable bags and promote more recovery systems in order to scale down the environmental impacts of any type of carrier bag.

PROS & CONS OF ACTION TO SUPPRESS PLASTIC BAG USE

While consumers have embraced the use of plastic carrier bags because they are highly functional (able to bear 1,000 times their own mass), light, strong, waterproof, cheap, and a hygienic way to transport food and other products from the shop or retailer, retailers and industry favour their use because they are cheap, easily

stored and transported, and can be used for advertising purposes. Modern HDPE bags weigh 2 - 8 g, while the average thin, lightweight carrier supermarket bags weigh 5 - 7 g.

On the other hand, environmental campaigners and some local authorities oppose the plastic bag, on the grounds of sustainable consumption, consumerism, littering and producer responsibility. On a global level, most national administrations do not pursue policies aiming at controlling the use of plastic bags. However, some do and these are described in this report.

The arguments for and against the plastic bag have been made frequently. Australian consultants Nolan-ITU (2002) have summarised the situation on life cycle grounds as:

- there is significant potential to reduce life cycle environmental impacts of plastic bags in the form of resource consumption, energy, greenhouse gas emissions and litter
- a substantial shift to more durable thick-walled bags would deliver environmental gains over the full life cycle of the bags
- heavy duty thick-walled plastic bags with a long usable life were found to achieve the greatest environmental benefits
- ***little or no gain is to be derived from the shift from thin-walled plastic bags to other single use bags (such as biodegradable bags and paper bags),*** with potential litter gains offset by negative resource use, energy and greenhouse outcomes.

On this last point, a number of LCA studies, including the above-mentioned UK Environment Agency one as well as that produced by Carrefour in 2004,[9] concluded that thin-walled plastic bags came out best compared to paper and biodegradable bags (when used optimally) for practically all of the environmental indicators taken into account.

In 2009, consultants AEA were commissioned by the Welsh Assembly Government to help inform proposals on charging for thin-walled carrier bags in Wales.[10] Within the report, the authors set out the reasons for and against further action.

Table 2. Arguments for and against actions against thin-walled bags

Arguments supporting further use reduction	Arguments against further use reduction
Encouraging a change in attitude to resource use, moving away from the 'throwaway' society to a more sustainable model	Plastic bags are made from a by-product of oil refining and so make use of resources that would otherwise be thrown away
The simple fact that alternatives are readily available	Plastic bags generate only a small share of the overall burden of human activities on the environment and are efficiently produced
Environmental benefits of long-life bags compared to thin-walled bags	There is a potential that initiatives taken to reduce plastic bag use could have negative consequences for the environment
A desire to reduce blight of littering and associated social impacts	Alternatives such as cotton or canvas bags may be less hygienic
The desire to reduce other impacts of plastic in the environment, including possible effects on infrastructure (eg blocked drains)	Plastic bags have a high calorific value, useful when MSW is incinerated
Public pressure for action against plastic bags	Thin-walled bags can be and are re-used
Improving waste management by focusing on reduction in waste generation and re-use rather than options further down the waste hierarchy (including recycling)	Labour conditions at some overseas factories manufacturing textile bags have been criticised
	A reduction in demand for thin-walled bags would cause UK job losses
	Shoplifting is made easier when many people carry their own bags
	Thin-walled bags are recyclable

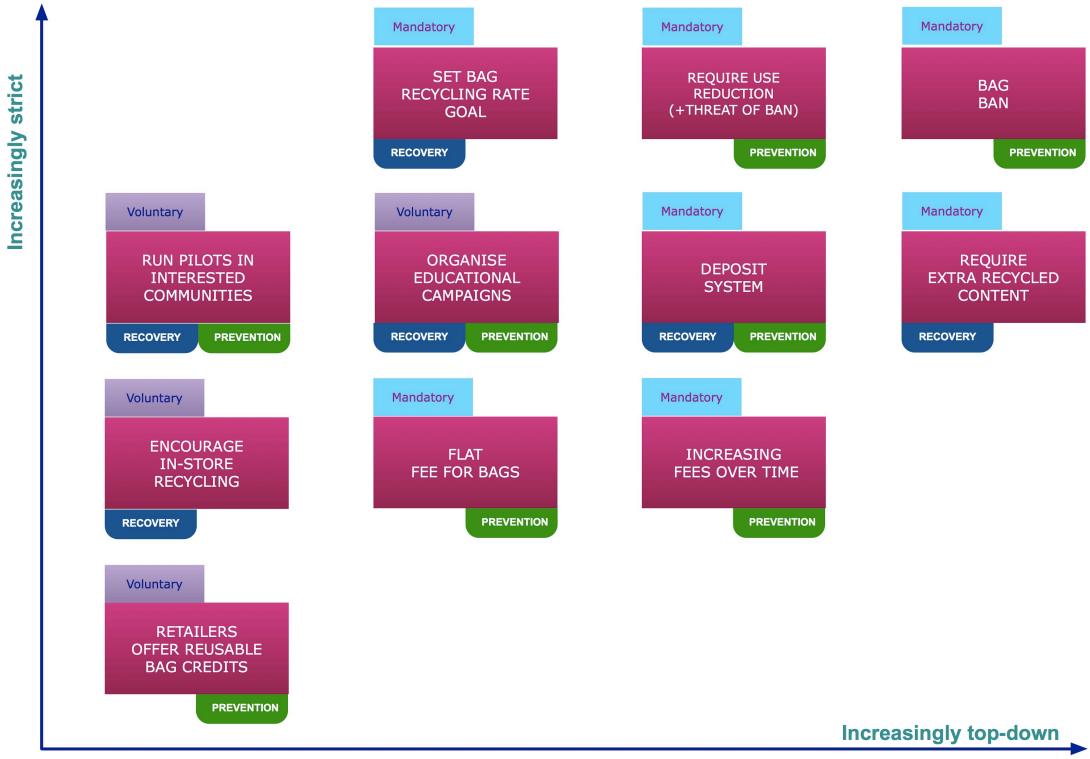
To the above can be added:

Arguments supporting further action	Arguments against further action
80% of marine litter comes from land	LCAs show that thin-walled plastic bags are among the most resource efficient solutions with a low environmental impact
	The main cause of littering is careless human behaviour, and it is this behaviour which needs to be addressed

CHANGING BEHAVIOUR TOWARDS PLASTIC BAG CONSUMPTION

There is a range of possible tools available to policy-makers seeking to reduce plastic bag consumption. These may range between setting up litter management schemes run by voluntary groups or local authorities (with or without financial support from industry/retailers), to a mandatory ban on the use of thin-walled plastic bags. Figure 2 depicts the array of possible instruments, grouped according to administrative complexity.

Figure 2. Instruments available for a change in behaviour toward plastic bag use



MANAGING PLASTIC BAGS IN THE EUROPEAN UNION

Every year, the average EU citizen consumes approximately 500 plastic carrier bags, and most are used only once.[11] According to the European Commission, the total volume of plastic carrier bags produced in the EU-27 in 2008 was 3.4 million tonnes, which equals the weight of over two million passenger cars.

European Plastic Films (EuPF, 2011),[12] a sector group of the umbrella association European Plastics Converters, refutes the accuracy of these figures, and maintains that these include all kinds of plastic bags (i.e. also garbage bags, fruit & vegetable bags, freezer bags). EuPF considers that the true figures for the EU stand at approximately 1.8 million tonnes for 2008 and that carrier bags represent no more than one third of this figure.

According to European Union (EU) law,[2] plastics bags are classified as packaging. They may therefore only be sold in the EU if they comply with essential requirements set out in the Directive, which specify that packaging weight and volume must be reduced to the minimum necessary for safety, hygiene and consumer acceptance of the packaged product.

In 2011, the European Commission (DG Environment, 2011)[13] announced plans to launch a Green paper on plastic waste in the environment, together with a study to assess the scale of the problem and possible solutions (including waste prevention targets, a ban or compulsory pricing measures for non-biodegradable plastic bags). In May 2011,[14] the European Commission sought the views of the public on how best to reduce the use of plastic carrier bags.

The Commission asked if charging and taxation would be effective, or if other options (such as an EU-level ban on plastic carrier bags) would be better. Opinions were also sought on increasing the visibility of biodegradable packaging products, and boosting the biodegradability requirements for packaging. The web-based consultation was due to run until August 2011.

The issue of banning plastic bags was sparked by Italy's introduction of a national ban on non-biodegradable plastic bags on January 1, 2011, and this without notifying the European Commission, as is required for such technical regulations. The ban was not only in breach of the EU's Packaging and Packaging Waste Directive, but also in breach of EU internal market rules, which prohibit restrictions to the free movements of goods and services between Member States. The Commission declared that it would assess the law and launch legal action against Italy, if it concluded that it did not comply with EU law.

European packaging recovery organisation PRO EUROPE has a clear position.[15] The organisation believes that neither the imposition of a mandatory levy or ban on plastic bags nor the promotion of biodegradable plastic bags constitute adequate tools to reduce the environmental impact of plastic bags. Additionally, efforts to achieve environmental improvements should include initiatives involving the business sector. Such efforts can be developed in constructive collaboration with the local authorities and government, and prove to be more effective especially when combined with awareness-raising and education campaigns as well as the promotion of reusable bags.

AUSTRIA

In Austria some 350 million plastic bags are used each year (ca. 7,000 t/y). Austria has no legislation in place banning plastic bags; however, the Greens intend to promote voluntary agreements with supermarket chains (STRABAG Umweltanlagen, 2011).[16] There are neither national bans, taxes nor a national recycling scheme for plastic bags.

In general, according to PlasticsEurope (2011),[17] consumers are required to pay for plastic bags. Large plastic bags cost around EUR0.25 in supermarkets while small ones are free. Fashion shops and various other stores offer plastic bags free of charge, although many use paper bags as well.

[2] Directive 94/62/EC on packaging and packaging waste, Annex II

Viennese households generated about 510,000 tonnes of waste in 2010, containing some 2,000 tonnes of plastic bags (2011).[18]

According to a poll described in the Austrian Times (2011),[19] most Austrians would support a ban on plastic bags. In that survey, Viennese researcher Karmasin found that 73 per cent of Austrians would back such a law, while only 24 per cent would not.

The researcher noted that the number of supporters of a ban on plastic bags was rising. In March 2009, only 64 per cent favoured a law prohibiting their use. Karmasin interviewed around 500 Austrians for weekly magazine *Profil*.

In January 2011, Austria's Environment Minister Berlakovich published a 'five-point plan' in a move to reducing the use of plastic bags, not only because of their oil, energy and water use, but also because plastic bags are mainly imported from outside the EU, thereby significantly increasing their carbon footprint. PlasticsEurope (2011)[20] reported that he sought to verify whether it would be possible to change the EU Packaging & Packaging Waste Directive, in order to make national bans possible.

At a European level, the Austrian Government has also been active, adding a point on plastic bags to the Environment Council agenda of the March 14, 2011. Acknowledging that the Italian legislation banning non-biodegradable plastic bags was in breach of the European Directive on Packaging and Packaging Waste Directive, it called on the European Commission to investigate, among other things, the possibility to introduce measures against the distribution of carrier bags free of charge and the introduction of targeted measures for the avoidance of plastic carrier bags.[21]

MEASURES CONCERNING THE USE OF PLASTIC CARRIER BAGS - AUSTRIAN DELEGATION VIEW[22]

Plastics do not degrade for a long time, which make possible their multiple use, recycling and finally, if bags are incinerated, capture of the resulting energy. For the same reason, dumping into landfill and careless discarding of plastic bags should be prevented, to protect health as well as the environment.

Plastic carrier bags are classified as packaging under the current Packaging Directive (whether free of charge or paid for) and are therefore subject to the corresponding national transpositions of the Directive. Packaging that complies with the basic requirements of the Directive cannot be banned. Furthermore, waste management offers no possibilities to treat this kind of packaging differently from packaging consisting of other materials, since the Directive covers packaging of any kind.

A number of national initiatives to conserve resources and to leverage the principle of waste avoidance already exist within the European Union, aiming to reduce the use of plastic carrier bags to a minimum. They range from taxes on packaging and waste disposal (the costs of which the producers usually pass on to the consumers), through fees for plastic carrier bags (going for example to a recycling fund), to voluntary labelling of plastic carrier bags and labelling of biodegradable bags.

These measures are in some cases supported and promoted by media campaigns, eg for the use of reusable bags.

To make such measures as effective as possible, Austria invites the European Commission to analyse the following issues on a European level:

- evaluation of existing regulations concerning plastic carrier bags in EU countries
- possible introduction of mandatory labelling for (biodegradable) plastic carrier bags, with
- particular reference to mandatory labelling of materials
- possible alternatives to the use of plastic carrier bags
- introduction of targeted measures for the avoidance of plastic carrier bags
- possibility of measures against the distribution of plastic carrier bags free of charge.

BELGIUM

To decrease the use of thin-walled plastic carrier bags, Belgium has applied a combination of a tax and a voluntary agreement (2011).[23] There is no national scheme for recycling plastic bags in Belgium, according to PlasticsEurope (2011).[24]

There is the so-called packaging tax, which also applies to disposable packaging (Art. 381 of the ordinary law of 16 July 1993, reviewed by art. 157 of the law of April 27, 2007). Putting on the market disposable sacks and bags made of plastic, designed to transport goods bought in retail trade, will necessitate paying a packaging tax of EUR3 per kg. This means a tax of almost EUR0.01 per plastic carrier bag. Reusable and biodegradable bags are excluded from this tax, which is passed to the consumer at the point of sale.

Before the packaging tax was established, the retail sector had already planned to reduce the use of plastic carrier bags. Since then, the use of such bags decreased rapidly. In most shops, no free thin-walled plastic carrier bags are to be seen. Many shops have reusable bags or boxes for sale, in case clients have need of them. The goal of this initiative is to reduce the amount of thin-walled plastic carrier bags by 90% by 2013, compared to 2003. In 2010, a reduction of 85% was achieved. According to industry body IVCIE (2011),[25] this voluntary commitment of the sector renders a ban superfluous.

It is important to note that this initiative (which has been hailed as a green success story by the retail sector, in contrast to the strong opposition against the tax) would probably not have had such a strong impact without the introduction of a packaging tax, or if this tax had been too low.

The waste decree of the Belgian Walloon region (modified 22/3/2007) made explicit an intention to ban from 2010 onwards the use of one-way carrier bags in classified (i.e. subject to an environmental permit) retail outlets (Federplast, 2011).[26]

The ecotax gave additional incentive to the retail sector to stop the free distribution of one way carrier bags and to offer reusable and biodegradable bags for sale. A ministerial circular letter clarified that bioplastic carrier bags are excluded from this tax. Reusable bags are also excluded: the tax administration uses the film thickness as a criterion to define reusability.

Also, it is worth mentioning Belgium's laws on the use of the claim 'biodegradable' or '(home) compostable'. Products that claim to be either biodegradable, compostable or home compostable must comply with the relevant CEN and ISO standards, based on EN 13432 (as described in the annexes of the *Royal Decree (RD) of 9 September 2008*). The objective of this RD is to create a qualitative waste stream of compostable materials. Even more important in this context, packaging cannot claim to be biodegradable. This is meant to prevent littering. Since many people could understand 'biodegradable' as 'not harmful if thrown away in the environment', this claim could result in an increase in littering. These measures protect the Belgian market from unreliable claims such as, for example, *oxo-biodegradability*. Materials which are oxo-biodegradable apply to ASTM D6954 standard, but not to EN 13432 and therefore they do not comply with the requirements of the RD. Thus, only claims of compostability or home compostability are allowed on packaging.

BRUSSELS CAPITAL REGION

Brussels Capital Region waste plan[27] aims to reduce household packaging waste by 4 kg/person/yr by 2013 and by 10 kg/person/yr (10,000 t/y) by 2020.

Since 2004, FEDIS[3] had undertaken awareness-raising activities to limit the use of plastic bags. These were successful, as consumption of free thin-walled plastic checkout bags declined by more than two-thirds. By contrast, the number of reusable bags and other alternatives have risen strongly. The Brussels administration claims that the establishment in 2007 by the Belgian federal government of an environmental tax on checkout bags (July 2007) certainly contributed to this.

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[3] *FEDIS is the spokesman for the trade and services in Belgium. Its members account for 11 per cent of GDP and employ some 400,000 people. In November, 2010 Fedis changed its name to Comeos.*

Given the results achieved in major retailers, it does not seem [to the Brussels administration] to be a high priority to take additional measures at this level. On the other hand, the effect of the tax on small businesses is more difficult to evaluate. Since 2004, Brussels Environment has conducted campaigns to promote reusable bags to small businesses; surveys indicate a slow progression in reusable alternatives.

Brussels Environment plans evaluate the results of its activities to combat disposable bags in small businesses and will evaluate the possibilities of further reducing, or even eliminating, distribution of disposable bags at this level.

BULGARIA

Bulgarians use around 5,000 tonnes of plastic bags each year. According to The Sofia Echo, Bulgaria's Environment Ministry has decided to introduce a tax on plastic bags from July 1 2011 (January 2011).[28]

PlasticsEurope (2011)[29] notes that the Government declared that the aim of the tax is to 'stop the usage of lightweight PE bags as they are littering the environment, and to stimulate the usage of reusable bags'.

The tax is set to increase each year, with the price of one bag to be raised to 0.55 Lev (EUR0.28) in 2014 from the initial 0.15 Lev (EUR0.077). The tax will be paid to the Environment Ministry by those who provide the bags, and the charge will be passed to consumers at the points of sale. According to local businesses, however, the proposed timescale is too short for manufacturers and retailers to adjust their operations.

A Bulgarian National Television (BNT) report (November 20, 2010)[30] showed people at markets using large number of plastic bags for their purchases, sometimes adding up to around a dozen for one shopping trip. Far more bags are used in cities than in small villages.. The report said that in a year, an average Bulgarian uses about 270 plastic bags.

In an interview, Theodora Zheleva, of the Environment Ministry's department for the management of household and construction waste, said that the tax would apply to plastic bags thinner than 15 microns. However, producers believed that this was not a solution. Antoinette Pernikova, executive director of the **Polymers Association**, said that before there was a clear mechanism for enforcement, the measure would merely stimulate the illicit economy.

CYPRUS

Each year some 1,700 tonnes of plastic bags are used in Cyprus, and supermarkets continue to hand out free plastic shopping bags.

In March 2008 discussions took place in the Cyprus House of Parliament regarding two legislative proposals (ECEBD, 2011).[31] The first, that all plastic bags should be biodegradable and the second prohibiting supermarkets from giving away free plastic carrier bags. PlasticsEurope (2011)[32] reported that these proposals were rejected.

LOCAL INITIATIVES

During a Thomas Cook-funded waste management conference in Nicosia, Cyprus in 2009, concerns were raised over plastic waste, both in terms of the amount of waste produced by hotels and the problem of plastic bag littering (Middleton, 2011).[33] These issues were addressed in a project with the following objectives:

- to reduce the use of plastic items in Thomas Cook (TC) target hotels in Paphos, through the delivery of an education and training programme
- to reduce the use of supermarket plastic bags by customers in TC self-catering properties in Paphos through the provision of reusable cloth bags.

REDUCING PLASTIC WASTE AT TC SELF-CATERING PROPERTIES

Five self-catering properties were selected for the project, based on their proximity to local supermarkets. A local producer supplied 4,500 reusable cloth bags and a card for customers was printed, to be stamped by supermarket staff whenever the bag was used. Customers who handed in completed cards to their rep at the end of the holiday would be entered into a prize draw to win a discount on their next holiday.

The 4,500 bags generated EUR13,650 in income for a local producer in Larnaca. The bags were to be issued at the welcome meetings, together with the stamp card. However, many guests did not attend the meeting and so did not learn about the project. A change of strategy was required and the supermarkets were given the bags to offer them to customers. Of the 3,450 bags distributed, consultants estimated that the project prevented 41,400 plastic bags from going to landfill. This also resulted in cost savings for the supermarkets, with one owner reportedly saving more than EUR60 in a single month.

CZECH REPUBLIC

The Czech Environment Ministry (2009)[34] reported that Czech stores distributed up to three billion plastic bags a year free of charge, amounting to 9,000 tonnes of plastics. Estimates of per capita consumption of plastic bags range between 150 – 300 per year.[35] There are presently no taxes, charges, bans or recycling schemes in place, and no plans for immediate action for change.

In 2009, Czech environment minister Martin Bursik proposed a new law on waste intended to fix many shortcomings within existing legislation.[36] Among other things, the law would help reduce the amount of household waste going to landfill and simplify legislation. The Government wanted to encourage the separation of waste by proposing that local fees for waste collection be directly tied to the amount of waste produced. The new law would also tighten the requirements for landfill operations and increase the powers of regional authorities. From 2011 there will be a gradual increase in fees that landfill operators will have to pay for each tonne of landfilled municipal waste. The law would also ban plastic bags being given out for free at retail stores, but it would be up to retailers to decide how much they would charge per bag.

Small and medium sized companies (SMEs) dealing with waste would also receive financial support through tax breaks and reduced social security and health insurance costs. Mr Bursik also said his department was working with the transport ministry to promote recycling through public procurement, for example contracts to build noise screens from recycled plastic for motorways and railway routes.

TESCO CZECH LAUNCHES DEGRADABLE BAGS RANGE

In April 2010, Tesco Czech launched 'degradable' plastic bags,[37] curiously described as intended 'to help reduce impacts on landfill sites'. The term 'degradable' was not defined.

DENMARK

A tax on carrier bags was introduced in Denmark in 1994.[38] The purpose was to prevent the use of one way carrier bags (paper or plastic). Customers were consequently encouraged to use textile bags or reuse carrier bags.

The mass-based tax rate which is applied in 2011 is:

- Paper - 10 DKK per kilo
- Plastic - 22 DKK per kilo.

A supermarket will typically charge 3 - 4 DKK for a carrier bag of plastic or paper. The introduction of the tax in 1993 led to a fall of one third in demand for plastic bags.

ESTONIA

By the middle of 2010, Estonia was expected[39] to introduce charges for plastic carrier bags. It was thought likely that store-bought plastic bags would start costing more during 2011.

According to the legislative proposal, the plastic shopping bags will cost three kroons more (or around EUR0.20 - from January 2011 Estonia adopted the Euro). The Estonian Parliament was expected to deliberate on the topic of an excise tax on plastic bags during the following months. The press speculated that retailers would not increase the price of plastic bags, but would add the tax to other goods. The plastic bag tax is meant to motivate buyers to prefer paper or textile bags.

FINLAND

According to Finnish Solid Waste Association (2011),[40] around 400-500 million plastic bags are used each year in Finland. Finland has not enacted any national legislation specifically targeting plastic bags.

Tampere Regional Solid Waste Management (2011)[41] reports that there are several initiatives in place to reduce the use of plastic bags. Public institutions (and occasionally some private companies) provide free multiple use textile bags that can replace plastic bags.

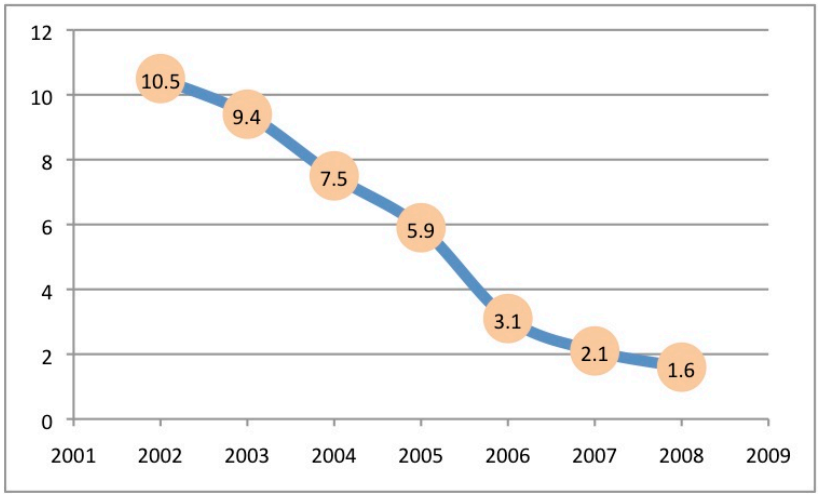
Almost all supermarkets sell durable bags, paper bags and plastic bags. Multiple-use bags are more expensive than plastic bags. Some supermarket chains have collection points where customers can return their used plastic bags for recycling.

FRANCE

According to the government, 1.5 billion plastic bags were distributed in French supermarkets in 2009 (see Figure 3, below). This had fallen by 85%, from 10.5 billion in 2002.[42] Plastic shopping bags are not yet banned in France. A proposal to introduce an eco-tax on thin-walled plastic bags in 2011 was postponed until 2014. The 2014 eco-tax would not be applied to biodegradable bags made with minimum 40% renewable resources.

However, according to ORDIF (*L'Observatoire Régional des Déchets d'Ile-de-France*, 2011),[43] the FCD (a Federation of retailers with 26,000 outlets and an aggregate turnover of EUR170 billion) is said to have committed its members to completely phase out thin-walled bags by the end of 2011. Non-members would be invited to follow the same approach.

Figure 3. Number of thin-walled plastic bags issued in France, 2002 to 2008 (billions of bags/y)



In March 2010, the French Environment Ministry (Ministère de l'Ecologie, de L'Energie, du Développement Durable et de la Mer)[44] reported that supermarkets and hypermarkets had made a great effort to reduce the distribution of thin-walled plastic bags in favour of reusable solutions, such as flexible HDPE bags, woven PP tote bags and fabric bags

CORSICA

As a local initiative in France, Corsica has ceased using non-biodegradable plastic bags since 2003. This is not a ban, but a voluntary agreement among the four retail networks on the island.

GERMANY

Plastic bags comprise around two per cent of Germany's consumption of plastics,[45] and this topic is not seen as a significant issue. Customers are required to pay for plastic bags, and there is a national recycling scheme in place (within the established green dot DSD system).

The Germany Federal Environment Ministry declared (2006) that it is unlikely that there would be any local schemes and campaigns targeting plastic bags. These would be unnecessary, because all regions and local authorities have separate collection systems for packaging (organised by the DSD and their sub-contractors). In summary, in Germany lightweight bags used to be a waste and litter problem before 1991, but this is regarded as having been solved by the German Packaging Waste Ordinance.

GREECE

ACR+ (2011)[46] reports that in Greece in 2008, householders used 60 million plastic bags. Since 2001, general Greek legislation to reduce, reuse and recover packaging also extends to plastic bags. However, in 2008, less than one per cent of those bags used were actually recycled and recovered.

In 2007, supermarket managers were said to have responded positively to a bid by Athens' Mayor Kaklamanis to start replacing plastic bags with more environmentally friendly fabric equivalents or reusable heavy-duty plastic ones, according to Ekathimerini.com (2007)[47]. The initiative, an extension of Kaklamanis' campaign to boost recycling, aims to reduce the amount of plastic bags being discarded. Initial talks with senior officials from supermarkets, including Metro, Veropoulos, Atlantis and A-B Vassilopoulos, were reportedly encouraging, though there is no information available on progress made since then.

HUNGARY

Little information is available on the consumption and management of plastic bags in Hungary, though it is reported (2011)48 that there is an eco-tax and a national recycling scheme in place.

IRELAND

Approximately 1.2 billion plastic shopping bags were provided to residents free of charge before the Irish Government introduced the EUR0.15 per bag tax in March 2002. Per capita annual consumption of these bags fell immediately from 328 to 21 bags. The levy was increased to EUR0.22 in 2007, by which time per capita consumption had crept back to 33 bags/y. The increased levy provoked a reduction to 27 bags per person per year in 2008.

Environmental levy yielded EUR23.4 million in 2009,[49] which at EUR0.22 per bag equates to perhaps 120 million bags/year. The Irish EPA (2004) reports that the levy resulted in a 90 per cent reduction in plastic bag consumption, where shops reported handing out about 277 million fewer bags than normal and raised EUR3.45 million in its first three months.

On January 11, 2011, the Irish Government published the Environment (Miscellaneous Provisions) 2011 Bill.[50] The Bill provides, among other things, for greater flexibility in the setting of the plastic bag levy and the landfill levy. It also provides for the introduction of a levy on incineration. However, there are no plans to increase the plastic bag levy at present.

Consultants RPS (2011)[51] note that the story from Ireland on the Plastic Bag Tax remains positive. Gradual increases in the levy over the years the Irish public have rendered the plastic bag rarely used in supermarkets.

In 2008 the Irish Government (2010)[52] reported that the levy yielded EUR 26.6 million (increased from EUR22.6 million in 2007) in revenue each year towards the Environment Fund, where it is being used for environmental purposes and to mitigate the damage already caused by the plastic bags.

Retailers who fail to implement the Levy Regulations correctly are liable on summary conviction to a fine not exceeding EUR1,905 or to imprisonment for up to 12 months, or both or, on conviction on indictment, to a maximum fine of EUR 12.7 million, or to imprisonment for up to 10 years, or both.

A system of daily fines applies where an offence continues to be committed after conviction i.e. up to EUR 254 per day for a summary conviction, or up to EUR 127,000 for conviction on indictment.

LITTER

The Irish Department of the Environment (2007) noted that the primary purpose of the plastic bag levy is to reduce the consumption of disposable plastic bags by influencing consumer behaviour, and that the levy has been an outstanding success.

Table 3. Litter arising from plastic bags (per cent)

Prior to Levy	5.00
2002	0.32
2003	0.25
2004	0.22
2005	0.22
2006	0.52
2007	0.29
2008	0.32
2009	0.24

The most recent survey data available for 2009 (National Litter Pollution Monitoring System, 2010)[53] shows that plastic bags constitute 0.24% of litter pollution nationally compared to an estimated 5% prior to the introduction of the levy.

The plastic bag levy was increased from EUR0.15 to EUR0.22 in July 2007 in a further bid to reduce littering. There was a decrease in plastic bags as a percentage of the National Litter Composition from 0.32% in 2008 to 0.24% in 2009.

Costs of administration of the levy were very low, amounting to about 3% of revenues, because it was possible to integrate reporting and collection into existing Value Added Tax reporting systems. Response from the main stakeholders: the public and the retail industry, was overwhelmingly positive. Central to this acceptance has been a policy of extensive consultation with these stakeholders.

ITALY

Italy is the only EU Member State which has imposed a ban on non-biodegradable bags. Prior to the ban, a total of around 220,000 tonnes of plastic bags were used each year.

Amsa SpA (2011)[54] provided the following information on recent developments on the new law banning plastic bags in Italy. Article 1 (Sections: 1129, 1130 and 1131) of the Legge Finaziaria 2007 (No. 296 of 27 December 2006), contained a ban on distribution and selling from January 1, 2010 of 'plastic bags for the transport of goods.. which are not biodegradable (bags) or by this date would not fulfil the criteria laid down by EU legislation and approved technical standards' with the goal of 'reducing emissions of carbon dioxide in the atmosphere, strengthen the environmental protection and support agro-industry in the field of bio-materials'. This deadline was subsequently extended to January 1, 2011 with D. L. No 194/99.

The ban on the bags entered into force but has caused a reaction on the part of producers. The result was an appeal to the Parliament by the associations of plastics processing companies (European Plastics Converters and Unionplast). According to these associations, the measure would not be valid because it breached the EU directive on packaging. Moreover, the law had not been notified to the European Commission according to the 98/34 procedure, a fundamental step for a measure with such an impact on the internal market.

The position of the Commission in this matter is still unclear. Indeed, it appears that the legality of Italy's decision may not be challenged, although an infringement procedure has been opened for the non-notification aspect. This has become both a legal and political issue, with EU Environment Commissioner, Janez Potocnik, stating at the outset of the Environment Council in March 2011 "It is clear that current trends in the plastic packaging industry are not sustainable: the production and use of disposable bags have exploded and the effects are all too evident in our environment and, in particular, in our seas. We will start a broad discussion that examines all options, including the possibility of an EU-wide ban of this type of plastic bag".

In February 2011, waste company ACEA launched an information/awareness campaign on separate collection and sustainable consumption (ACEA, 2011).[55] The project encourages people to choose reusable bags. Each citizen was offered a reusable bag called '*RIBORSA ACEA'*. This reusable gift is made in the Piedmont region from 100% recycled PET bottles.

This project involves 47 municipalities and 150,000 inhabitants. Free distribution of 70,000 bags was expected to have been achieved between February and May 2011.

LATVIA

On September 18, 2007, in the meeting of the Latvian Cabinet of Ministers, Regulations from the Ministry of the Environment (entitled Modification of the Natural Resources Tax Rule) were accepted (Latvian Government, 2007).[56] To encourage a reasonable use of plastic bags, the draft regulations propose to impose a tax, from 0.02 to 2.0 LVL (EUR0.03 - EUR2.8) per kg depending on polythene thickness.

The Baltic Times[57] reported in 2008 that the most noticeable action taken by businesses was a sudden ban on free plastic bags. Grocery stores no longer provide free plastic bags. Now they offer cloth bags for sale. People are said not to object to paying the extra 5 santims (EUR0.07) for a plastic bag.

LITHUANIA

No useful information on the management of plastic bags in Lithuania was found during the research phase of this report.

LUXEMBOURG

Between 2004 and 2007 the number of thin-walled bags used in Luxembourg fell from 60 million to 9.5 million, a decline of more than 85%.[58]

The authorities estimate that between 2004 and 2007, some 428 tonnes of waste plastics were prevented through a reduction in the consumption of thin-walled bags.

The management of packaging and packaging waste in the Grand Duchy of Luxembourg is determined by the Grand-Ducal Regulation of 31 October 1998, as amended. A number of successive voluntary agreements (2004-2006[59], 2006-2008[60] and 2008-2012[61]) were signed between the Minister of Environment and the organization Valorlux, to promote reusable bags.

LUXEMBOURG ECO-BAG PROJECT

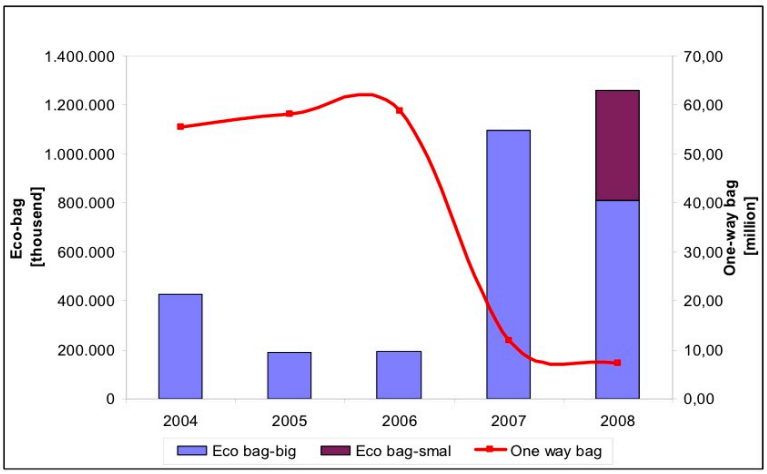
Luxembourg's 2010 national waste plan (*Plan général de gestion des déchets*)[62] describes the national eco-bag project, launched by Valorlux in January 2004 to minimise the distribution of thin-walled plastic bags. From

2004 to 2007, 1.9 million eco-bags (woven PP) were placed on the market, thereby avoiding the supply of 50 million thin-walled bags.

Overall the project was deemed a success at national level with a use rate of 51.5% by 2007. Damaged eco-bags are replaced free of charge. Between 2004 and 2010, VALORLUX and participating retailers had sold about 4.5 million eco-bags in the Grand Duchy.[63] Valorlux plans to extend the project to other trade sectors, such as bookshops, bakeries, butchers and pharmacies). Until January 2007, Eco-Bags were sold in supermarkets in parallel with the free distribution of thin-walled bags. Thereafter, the distribution of free thin-walled bags ceased (but they could be purchased for EUR 0.03. According to Valorlux (2007)[64] the Eco-bags were sold for EUR1, though from January, 2007 the price was cut to EUR0.80.

Figure 4 (2010)[65] below shows the significant impact which the campaign had on the use of thin-walled plastic shopping bags.

Figure 4. Trend data in bag use within the six major supermarket chains in Luxembourg (2004 – 2008)



Valorlux (2011)[66] reports that smaller Eco-bags have been available since 2008. More manageable, small eco-bags are better suited for purchases in corner shops. These are available at a price of EUR0.60.

MALTA

On average the Maltese use two bags per family a day (50 million plastic bags/y). General Retailers and Traders Union director-general reported[67] that retailers and traders in Malta spend EUR3.5 million each year on the free issue of plastic bags in Malta.

According to Malta's Ministry for Rural Affairs and the Environment (MRAE, 2006)[68] charges for plastic carrier bags fall under three categories:

- *biodegradable* for which no eco-contribution is due
- *degradable* for which an eco-contribution of 6 Malta cents[4] per bag is due
- *plastic bags* for which an eco-contribution of 7 Malta cents per bag is due

Since the regulations on plastic bags were introduced, a decrease of five million plastic bags was recorded in the first five months of 2005. Thus by the end of the year the country would have avoided the consumption of 20 million plastic bags, (a reduction of 40 per cent).

[4] *The Euro replaced the Maltese lira as the official currency of Malta on 1 January 2008 at the fixed exchange rate of 0.429300 MTL per Euro.*

THE NETHERLANDS

There are no specific regulations regarding plastic 'carrier' bags in supermarkets in the Netherlands. However, supermarkets in the Netherlands do not give away carrier bags free of charge. Customers are required to pay approximately EUR0.20 for thick plastic bags. Accordingly, the carrier bag is not considered to be a packaging placed on the market by the supermarket, but as a product that is sold to a customer.

Plastic bags do not fall under the producer responsibility obligations of the supermarket in the packaging and packaging waste legislation in the Netherlands. There is no specific taxation scheme for plastic carrier bags in supermarkets.

In the early 1990s the Dutch Ministry for the Environment concluded a packaging covenant with industry. One of the measures included in that covenant was an agreement by the supermarkets to stop giving away plastic carrier bags for free as from July 1991. This was implemented. When the first covenant expired this agreement was omitted from the second packaging covenant, which was concluded in 1997. However, the supermarkets did not change their policy and to date they do not give plastic carrier bags out for free.

There is no quantitative evidence of costs or benefits of this type of action in the Netherlands. Plastic bags end up in waste and go mainly to energy recovery. It is not considered an area for which policy action is required.

POLAND

The Polish Environment Ministry had prepared a *Draft Act on the Management of Packaging and Packaging Waste,*[69] which was subsequently abandoned. This instrument would have provided for the introduction of a recycling charge of PLN0.20-0.40 (EUR0.05-0.10) to be paid by the customers per plastic bag.

Green groups in Poland strongly criticised[70] the government's decision to drop the proposal. Revenues from the tax would have been used to support the collection of packaging waste as well as awareness campaigns. In material documenting the proposed changes, the government explained the plan had not been 'sufficiently thought through'.

PORTUGAL

Portuguese MPs have approved a legislative proposal setting a 90% reduction target for the supply and consumption of thin-walled plastic bags at wholesalers and supermarkets by 2017. There are intermediate targets of a 30% and 60% reduction by 2013 and 2015.

According to MP António Leitao Amaro, the long transition period will allow smaller retailers to adapt to the law's requirements. Compliance are assessed using figures supplied by Portuguese Green dot company SPV.

Income from fines for non-compliance will finance projects aimed at raising awareness among consumers. An accompanying law establishes a minimum discount of EUR0.05 per EUR5 spent in large supermarkets for customers who do not use plastic bags. The law[71] was published in December 2010 and was due to come into force three months later.

The draft [*Projecto de Lei nº 466/XI/2ª: Medidas destinadas à redução da utilização de sacos de plástico, Palácio de São Bento, 13 de Dezembro de 2010 - Draft Law No. 466/XI/2 th: Measures to reduce use of plastic bags - São Bento Palace, December 13, 2010*] set out a series of targets:

Reduction Goals (baseline year = 2007)

- reduction of 30% by 31 December 2012
- reduction of 60% by December 31, 2014
- reduction of 90% by December 31, 2016

Replacement measures to be promoted:

- provision of biodegradable bags
- provision of reusable bags at affordable prices
- environmental awareness of employees and consumers to promote the use of alternatives to plastic bags that are environmentally responsible
- promotion of environmental awareness campaigns among consumers, aimed at the separation of waste at source and the appropriate referral within the existing legal systems management
- adoption of one of the following economic mechanisms to encourage a reduction in the use of plastic bags:
    - levying a charge for the supply of plastic bags
    - applying a discount on the price of goods sold to consumers desisting entirely from taking free plastic bags.

Plastic bags are collected with other packaging materials for recycling.

ROMANIA

According to industry reports,[72] in 2009 Romanians used around 45,000 tonnes of plastic bags. In the same year an eco-tax was applied to shopping bags made of non-biodegradable materials. The level of this tax was 0.2 lei per bag (EUR0.05). In 2010 the eco-tax was cut to 0.1 lei/bag (EUR0.025) and is applicable only to shopping bags made from non-renewable sources. The tax is passed on to the consumer at the point of sale.

This economic instrument was introduced with the purpose of reducing the quantity of shopping bags used in Romania. As a result, retail chains now sell reusable shopping bags.

There is no data available to quantify the decline in use, though the Romanian Association of Solid Waste Management (2011)[73] reports that according to unofficial sources the decrease was between 6 and 10%.

SLOVAKIA

There is no special tax on plastic bags in Slovakia, but producers and importers must pay a fee of EUR0.17/kg to a national recycling fund, unless they recycle the plastic material.[74]

SLOVENIA

In Slovenia, there are proposals in Parliament for legislation to introduce a tax on plastic bags.[75]

The tax would stand at:

- 0.50 EUR/pc for bags made from at least 5% plastic material
- 0.40 EUR/pc for ≥ 95% biodegradable
- 0.20 EUR/pc for ≥ 95% textile

If the tax is approved and implemented, then the charges will be borne by consumers at the point of sale.

SPAIN

Instituto para la Sostenibilidad de los Recursos (2011)[76] reports that, in Spain, consumption of plastic bags is around 100,000 tonnes per year. Assuming an average weight of 7 g per bag, 100,000 tonnes equates to perhaps 14 billion bags per year, or a per capita consumption of 300 bags/y. Industry reports[77] that plastic bags are collected as household recyclables through Spain's Green Dot System, Ecoembes.

The Spanish plastics industry has promoted the use of reusable plastic bags according to Spanish UNE

standard (by AENOR, on PE reusable shopping bags). The UNE document includes technical requirements and environmental parameters such as water consumption, etc.

According to the ENDS Report (2011),[78] the Spanish government has long toyed with the idea of taxing the use of plastic bags, but its 2008 waste plan opted instead for 'voluntary agreements with agents in the packaging and distribution chain' to cut bag use.

However, the Spanish Government recently approved a draft law transposing the EU Waste Framework Directive. The draft law, which should be confirmed during 2011, contains a provision on replacing thin-walled bags. The following schedule for replacing thin-walled plastic non-biodegradable shopping bags will apply (using 2007 as a baseline):

- by 2013, replacing 60% of the stock
- by 2015 replacing 70% of the stock
- by 2016 replacing 80% of the stock
- in 2018 replacing all of the stock

This excludes those bags that are used to contain fish, meat or other perishable foods.

From January 1, 2015 any bags distributed will need to bear a message concerning their environmental impacts. The content and format of these messages will be determined by the Minister for Environment and Rural and Marine Affairs.

CATALONIA

Area Metropolitana de Barcelona (2011)[79] reports that during 2007, people in Catalonia used 2.3 billion disposable plastic bags. This amounts to 45 million bags a week, i.e., 908 bags per year to each household. Virtually every Catalan uses one disposable plastic bag each day throughout the year. Moreover, plastic bags represent 0.43% of total municipal waste generated in Catalonia.

Catalan Waste Agency (2011)[80] reports that since 2004, the Catalan Waste Agency (ARC) has subsidised more than 200 projects implemented by local bodies and not-for-profit organisations for the reduction of thin-walled plastic bags.

Since 2006, the ARC has met with representatives of the Catalan and Spanish distribution chain, such as the Catalan Board of Food Distributors (CEDAC), the Retail Confederation of Catalonia (CCC), the National Association of Major Distribution Companies (ANGED) and the Association of Spanish Supermarket Chains (ACES), among others, with the aim of reaching a voluntary agreement to prevent the generation of thin-walled plastic bags.

In 2008, two separate Bag Agreements were signed. The first was on February 18, 2008 with the Bon Preu Group, through which it agreed to a 20% reduction of thin-walled plastic bags in its 110 supermarkets. It is worth pointing out that by the end of the agreement period the reduction target was easily surpassed. On October 6, 2008, a second agreement was signed with the Xarxa Farma association. In this case the reduction target was 10% in 2009 and 20% in 2010, across its network of 200 pharmacies. The 2009 target was met and the 2010 result is currently being estimated.

2009 CATALAN BAG AGREEMENT[5]

On July 28 2009 there was an agreement between the Government, retailers and manufacturer in Spain and Catalonia. The signatories of this act were the Waste Agency of Catalonia, the Association of Chain Supermarkets Españolas (ACES), the National Association of Large Distribution Companies (ANGED), the Spanish Association Distribuidoras, Autoservicios and Supermarkets (ASEDAS), the Spanish Confederation of Commerce (CEC), the Confederation of Commerce of Catalonia (CCC), the Council of Food Distributors of

[5] *Pacte per la Bossa (Barcelona, July 28, 2009).*

Catalonia (CEDAC), PIMEC il'Asociación Spanish Manufacturers of Plastic Bags (AEFBP).

The Agreement established a framework for collaboration between the Catalan public administration and businesses in the aforementioned sector with the goal of reducing the consumption of thin-walled plastic bags by 50% by 2012 compared to 2007 consumption figures, with an interim target of 30% by 2009.

In 2010, the ARC produced a study on the consumption of plastic bags in Catalonia, assessing compliance with the interim target. The study shows that that interim target was met, with a figure of 227 bags per person per year, representing a 30.4% reduction compared to 2007 data.

The agreement entails the setting up of a technical committee composed of representatives of the signatory organisations and of the Catalan Waste Agency. The principal mandate of this committee is to follow up the actions and measures implemented by retailers to meet the reduction targets. As organisations formally sign up to the agreement (on an individual or collective basis), measures are specified to reduce the distribution of plastic bags in retail outlets. By signing up to the agreement, organisations agree to meet the set targets, but retain the freedom to choose how to do so.

To date, the main distribution groups in Catalonia have formally signed up to the Bag Agreement, along with a majority of small retailers.

ANDALUCIA

The region of Andalucia approved the introduction of Spain's first-ever tax on thin-walled plastic bags. A charge upon customers of EUR0.05 per bag was due to apply from January 1, 2011, rising to EUR0.10 a year later. Biodegradable and reusable bags are excluded, as are thin-walled bags for certain specified products. While it was approved by the regional government in July 2010 as part of an emergency deficit reduction and fiscal sustainability law, 'the measure is not designed to raise money but to improve sustainability and to protect the environment', according to the Andalucian government.[81]

With a population of more than 8.3 million and an average annual personal consumption of 280-300 plastic bags, Andalucia could raise up to EUR100m next year and twice that in 2012 from the tax.

SWEDEN

The Swedish Government does not attach particular importance to plastic bags, simply including this stream within producer responsibility, making producers responsible for the collection and disposal of their discarded products. A Government spokesperson noted (2011)[82] that in Sweden neither is there a ban on plastic bags, nor are there any plans to introduce any.

On December 30, 2010, Swedish retailer Hemköp[83] declared it was the first in Sweden to offer plastic bags made of renewable material. The bags are manufactured from a 'green' polyethylene, (the raw material is sugarcane). Plastic bags made of green polyethylene result in 70-75 per cent less CO2 emissions than ordinary plastic bags. The new bags were set to be available at all Hemköp stores in 2011. The material has the same properties as petroleum-based polyethylene and can be recycled in the same way.

UNITED KINGDOM

In 2008, approximately ten billion lightweight carrier bags were given away in the UK, which equates to around ten bags a week per household. In recent years, a debate around the relative environmental impacts of these lightweight carrier bags and their alternatives has emerged. In the UK there are no national mandatory targets for plastic bags.

In Britain, the Climate Change Act,[84] enacted in 2008, allows for the introduction of waste reduction schemes, and for powers to require a minimum charge for thin-walled carrier bags in England. The powers in the UK

Climate Change Act for provisions of charges for thin-walled carrier bags extend to Wales and Northern Ireland as well as England, but not to Scotland.

UK agency WRAP (Waste Resources Action Programme) has brokered a series of voluntary agreements, the most recent one being between the Scottish Government, Defra the Welsh Assembly Government and the Northern Ireland Department of the Environment with the British Retail Consortium (BRC) and its supermarket members. Participating retailers in 2009 were Asda, Co-operative Group, Marks & Spencer, Sainsbury's, Somerfield, Tesco and Waitrose. The agreement set a target to reduce thin-walled carrier bags by 50% by Spring 2009 using 2006 as a baseline. This target was narrowly missed with a 48% reduction achieved for the UK. In July 2009, an agreement to monitor carrier bag use in 2010 was made.

Bag use (thin-walled bags) per person in 2010 ranged from 7.6 to 8.9 bags per month per person (in May 2010) - roughly 100 bags per person per year. Annual trend data shows continued reductions in bag use – by weight and numbers. The monthly figures for total carrier bags reflect this trend but when looking at thin-walled bags alone numbers increased, albeit slightly, in 2010 compared to 2009.

Tables 4, 5 and 6 below (WRAP, 2010)[85] show the recent trends in the number and mass of thin-walled bags, and the lightweighting of these bags.

Table 4. Numbers of thin-walled bags (by UK nations)

	Number of single use bags (millions)		% reduction 2006-2009	Number of single use bags (millions)		% reduction 2006-2010
	May 2006	May 2009		May 2010	Reduction 2006 - 2010	
UK	870	452	48	475	394	45
England	718	372	48	391	327	46
Scotland	78.4	39.6	49	43.2	35.2	45
Wales	53.2	27.1	49	26.6	26.5	50
N. Ireland	19.8	12.2	38	14.5	5.38	27

Table 5. Mass of thin-walled bags (by UK nations)

	Number of single use bags (millions)		% reduction 2006-2009	Number of single use bags (millions)		% reduction 2006-20010
	May 2006	May 2009		May 2010	Reduction 2006 - 2010	
UK	870	452	48	475	394	45
England	718	372	48	391	327	46
Scotland	78.4	39.6	49	43.2	35.2	45
Wales	53.2	27.1	49	26.6	26.5	50
N. Ireland	19.8	12.2	38	14.5	5.38	27

Table 6. Average mass of bags

Average	May 2006	May 2009	% change 2006 – 2009	May 2010	% change 2009 – 2010
All bags	9.9	9.3	-6	8.3	-11
Thin-gauge PE bags	8.3	7.0	-15	7.0	-
PE bags for life	17.5	22.9	31	22.4	-2

In 2011, the British Retail Consortium (BRC, 2011)[86] announced that stores which collect plastic bags for recycling will also accept clean plastic film packaging in the same facilities, thanks to an agreement between the country's biggest supermarkets and the On Pack Recycling Label (OPRL) scheme.

Carrier bag banks can be found at more than 4,500 supermarkets. The thin plastic, also used around multipacks of cans and household goods such as toilet rolls, makes up 43 per cent of all plastic household packaging and weighs in at 645,000 tonnes every year. By comparison, plastic bottles account for 32 per cent - 480,000 tonnes. Thin plastic film is fully recyclable but until now most people have had no means of recycling it. By combining this stream with plastic bags for recycling, it is likely that recycling rates for both will rise as the public becomes accustomed to the new behaviour option.

Many supermarkets have launched initiatives to reduce the distribution of their thin-walled plastic bags. WRAP (2011)[87] has reported on these, which include trials undertaken at Tesco and Waitrose, described in the following sections.

CASE STUDY: TESCO

Since the launch of Tesco's Green Clubcard Points scheme in August 2006, shoppers have significantly reduced the number of plastic carrier bags used. This has removed more than three billion bags from circulation and has rewarded customers with points for reusing their bags.

Plastic bags have now been removed from view in all Tesco stores and are only made available if the customer needs them. The retailer has also installed plastic bag recycling units inside its stores. To reinforce this messaging Tesco has introduced signage both in store and in car parks to remind their shoppers to reuse their carrier bags. In addition, the company stocks a range of reusable bags and launched a limited edition designer range of reusable bags. Each bag was made from nine recycled plastic bottles with 50p from every sale going to Marie Curie Cancer Care.

The online arm of the company (Tesco.com) offer a bagless delivery option and rewards customers with extra Clubcard Points if they choose to have their shopping delivered without carrier bags. Currently around half of customers choose this option.

CASE STUDY: WAITROSE

Between March and May 2008 Waitrose trialled a number of initiatives in four of its branches. The aim was to reduce the number of thin-walled plastic bags given away and involved:

- Removal of bags from view at main checkouts
- Asking customers without their own bags if they would prefer to purchase a £0.10 'bag for life'
- Asking customers at basket checkouts if they needed a bag.

Waitrose monitored the impact on the number of transactions, any increase in sales of their 'bags for life' and the decrease in the number of thin-walled carrier bags given away. As some customers use thin-walled carrier bags as bin liners, impact on the sales of bin liners was also measured to see if a reduction in thin-walled carrier bags would lead to an increase in sales.

During this three month period, sales of 'bags for life' rose by approximately 1,100% which then after four or five weeks started to fall, indicating that customers were reusing them. The number of thin-walled carrier bags issued fell between 45 and 60% and there was no impact on trade or the sale of bin liners. Waitrose also collected customer feedback and found that customers were happy to reuse their bags but often forgot to bring them from the car into the store. Therefore the company introduced prominent signage at the store entrance as a reminder to customers.

These successful trial initiatives formed Waitrose's national carrier bag strategy and have now been implemented across all 213 stores.

SCOTLAND

Shoppers in Scotland use one billion carrier bags each year.[88]

The Scottish Government launched a campaign in 2009 to help retailers halve the amount of bags they hand out. Based on the premise that an elephant never forgets, the campaign ran on TV and radio, as well as in supermarkets and shops across the country. Research showed that 92 per cent of people think reusing carrier bags is good for the environment, but 59 per cent claim to forget their reusable bags and have to take new ones at the checkout.

Twelve major retailers and almost 500 independent shops participated, potentially reaching millions of consumers, making this the biggest high street campaign ever undertaken by the Scottish Government. The Government's approach is based on the expectation that the consumer will also be the ultimate beneficiary of a reduction in bag use, with local authority waste management costs being reduced.

The *Climate Change (Scotland) Act 2009*[89] includes a provision that allows Scottish Ministers to make legislation requiring retailers to charge for bags. More specifically, Ministers may require retailers to:

- charge for carrier bags supplied at the place where the goods are supplied for the purpose of enabling the goods to be taken away or delivered
- apply the net proceeds raised by such charges to the advancement of environmental protection or improvement or to any other purposes that may be reasonably regarded as analogous.

In Scotland, retailers have made clear, and Government has accepted, that work should focus on carrier bags generally and not only on plastic bags. Whilst plastic bags are worse in terms of litter, paper bags are worse for the environment (as more resources are needed for their production and transport).

In 2010, the Scottish Government undertook[90] to commission a study into the implementation of existing producer responsibility directives and initiatives in Scotland (including plastic bags), to determine how revisions could be made to drive waste prevention and recyclate markets in Scotland. The study would also look at options for extended producer responsibility and take-back schemes in Scotland.

WALES

On October 1, 2011, Wales will start charging for thin-walled carrier bags.[91] A minimum charge of £0.05 (EUR0.06) will be introduced as part of the Welsh Assembly Government's goal to dramatically reduce the number of carrier bags given out to shoppers. According to Keep Wales Tidy[6], plastic bags comprise 2.7% by weight of litter in Wales.[92]

In 2009 the Welsh took home on average 273 carrier bags per household (more than 400 million thin-walled bags in total) from the major supermarkets alone.[93] The Assembly Government believes the five pence charge is high enough to encourage people to change their shopping habits, but not so high that it will deter impulse shopping or place a significant burden on shoppers who have forgotten their reusable bags.

In the Summer of 2010, the Government was contemplating a charge of £0.07 (EUR0.08) per bag, but reduced this to £0.05 (EUR0.06) by the Autumn. The idea of the charge is not simply to make people pay for carrier bags, but to encourage shoppers to make use of the bags they already have. To encourage shoppers to re-use bags, the Assembly Government gave away free jute bags to the public. To receive a bag, people were invited to email their top tip for remembering to take a bag when shopping.

[6] http://www.keepwalestidy.org/

In a study for the Welsh Assembly Government, AEA (2009)[94] listed a number of recommendations for the design of a national charging scheme. These were strongly influenced by the Irish experience, which had been a success until then.

Recommendations included:

- an extensive country-wide awareness campaign, using a variety of communication channels to ensure the system and its objectives are understood
- early consultation of stakeholders, particularly retailers
- retail staff may need training to respond to customer queries or complaints
- regional support lines should be established for both customers and retailers
- bag specifications should be the same as those defined in the Irish legislation, though extended to include bags made from paper
- initial charge to be set around £0.10 to 0.15 pence (EUR0.12-0.18) per bag
- the charge is to be passed on to customers, and shown on till receipts
- the charge is to be collected from retailers either using the system of VAT returns or through separate return to a designated body.
- enforcement should rest with local authorities
- money raised is to be used for projects focused on sustainability in Wales
- the body or bodies chosen to allocate the money should exist already, removing the need for additional administration.

NORTHERN IRELAND

On March 8, 2011, the Northern Ireland Assembly considered[95] a bill to introduce a levy on plastic bags and granted the measure an accelerated passage through the Chamber. Ulster TV reported that the new legislation, which is included in the draft budget, would (if approved) see shoppers charged 15p (EUR0.18) per bag. Ministers said it could generate £16m over the next four years.

Sinn Fein's Daithi McKay (2011),[96] who proposed the plan, said similar legislation had been successful in the Republic. He argued that it would bring significant environmental advantages as well as being a source of revenue.

The Assembly has now moved to fast-track the bill, meaning it can leap-frog many stages which other bills must go through. However this decision has been met with concern from local retailers, who said the new measures have not yet received proper scrutiny. Critics consider the levy to be contradictory. The Assembly cannot both reduce the use of bags and raise revenue from the taxation of bags - if one aim succeeds, the other must fail.

MANAGING PLASTIC BAGS IN NON-EU EUROPE

CROATIA

According to industry reports (2011),[97] there are no bans or taxes in place in Croatia, and consumers use around 8,750 tonnes of plastic bags each year. There is a proposal for an eco-tax (though no sums are yet suggested), to stimulate the use of reusable and biodegradable bags.

Importers and manufacturers of plastic bags must pay 1,500 kuna (EUR201) per tonne as a charge for waste management. There is no national recycling scheme for plastic bags.

ICELAND

Around 16 million bags were sold in 2004 (in a population of around 300,000, equating to an annual per capita consumption of 53 bags). There is a EUR0.20 levy on lightweight plastic carrier bags.

In Iceland there is no national regional or local regulation in place regarding the distribution, disposal or recycling of plastic bags. Nevertheless, since Iceland is a EFTA member, legislation such as the Packaging and Packaging Waste Directive also apply on its territory, and plastic carrier bags are thus considered as packaging in Iceland. The levy is used for a number of projects, most of which have an environmental focus.

NORWAY

Norwegians use about 1 billion plastic shopping bags every year.[98] The bags account for about three per cent (15,000 tonnes) of the total amount of plastic waste, and approximately one per cent of all household waste.

In 2008,[99] Norway's Environment and International Development Minister was reported to have said that the country was considering a blanket ban on plastic bags.

A proposed ban on plastic carrier bags was rejected after studies by the Norwegian Pollution Control Authority and Green Dot Norway concluded that a ban would not only be contrary to the EU Packaging and Packaging Waste Directive, but would also not achieve long-term environmental gains.

Norwegian Resource Centre For Waste Management & Recycling, notes (2011)[100] that when plastic shopping bags were introduced in Norway in the 1960s, they were free of charge and were welcomed by the public. After several years, the authorities found that consumption had ballooned, and decided to introduce a tax. This resulted in a massive drop in consumption. Waste collectors complained, having been used to handling waste in plastic bags instead of loose waste (this was before wheeled containers and container lifts on the collection trucks were introduced, so there was more manual handling of waste). Giving in to this pressure, the tax was removed, and citizens reverted to placing their waste in shopping bags. Shops began to charge small sums for the bags, but the cost was so low that it offered no deterrent.

All residual waste in Norway is now incinerated with heat recovery, and most of the plastic bags are energy recovered.

A report in 2008[101] for Norway's Pollution Control Authority (SFT) declared that plastic carrier bags are an 'insignificant' environmental problem and should not be banned. Around 80 per cent of the billion or so bags used annually are used to dispose of household waste, and thus very few bags end up littering the countryside. SFT noted that all the indications are that plastic bags, from a lifecycle perspective, outperform paper bags on an environmental level,.

Some shops use biodegradable bags. ICA (a Swedish chain also present in Norway) started this a number of

years ago, also other chains are planning to do the same. This is encouraged by the NGOs, but many also point on the problems when these bags are mixed with the conventional plastic bags recycling. Also, in Norway, only a small proportion the waste is composted, so there is very little need for biodegradable bags.

Norway Post (2009)[102] noted that post offices and business centres distribute one billion plastic bags to customers each year. Plastic bags that decompose in sunlight have now been purchased in order to decrease their environmental impact.

SWITZERLAND

PlasticsEurope (2011)[103] reports that an initiative is underway in Switzerland to ban non-biodegradable plastic bags.

The publication Le Nouvelliste reported (2008)[104] that a Swiss National Councillor filed a motion in the Federal Parliament directing the Federal Council to prohibit bags which could not be reused or recycled. This does not appear to have been successful. According to the Swiss Plastics Association,[105] the MP had called for the national ban on plastic bags shortly after parliamentary approval of a ban in Canton of Jura, a rural area in the north west of the country.

MANAGING PLASTIC BAGS IN THE REST OF THE WORLD

ARGENTINA

In Argentina,[106] a federal bill has established the national prohibition of the use of polythene and other conventional plastic carrier bags. These are to be gradually replaced with degradable materials for containers and/or biodegradable materials that are compatible with the minimisation of environmental impacts.

In the Province of Buenos Aires, legislation prohibits the use of non-biodegradable bags throughout the province. Businesses will have up to two years to remove the current system and replace it with alternative products such as paper or biodegradable plastic bags.

In Mendoza Province, non-biodegradable bags have been prohibited by Act 7319 of 2004.

AUSTRALIA

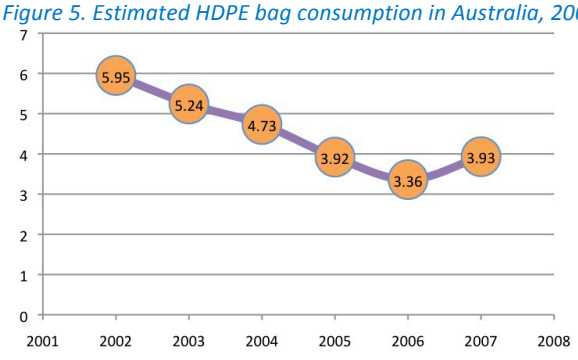
In 2007, Australians used around four billion plastic bags. In 2002, Australia's Environment Protection and Heritage Council[7] (EPHC)[107] resolved to reduce the environmental impacts of plastic bags. A voluntary retailer Code of Practice was the primary mechanism deployed to achieve this.

The Code operated from 2003 to 2005 and committed major retailer signatories to achieve a 50% reduction in plastic bag use by 2005. Major retailers reduced plastic bag use by about 41-44%, and Australians reduced overall plastic bag use by about 34%. Given the limited potential for subsequent voluntary initiatives to significantly reduce plastic bag use, in June 2006 EPHC committed to phase out plastic bags by the end of 2008, and to consider regulatory options for achieving this. EPHC reaffirmed this objective in June 2007.

In Australia, the predominant types of plastics used for plastic bags are high-density polyethylene (HDPE) and low-density polyethylene (LDPE). The HDPE 'singlet' bag is usually (but not always) a non-branded bag, used mainly in supermarkets, take-away food and fresh-produce outlets, but also in smaller retail outlets such as service stations and newsagents. The LDPE boutique-style bags are generally branded and are used by stores selling higher value goods, such as department stores and fashion outlets.

In 2006, the consumption of plastic bags in Australia was estimated to be 3.36 billion HDPE plastic bags, of which 40 million are estimated (based on the National Litter Index) to have ended up in the litter stream[108]. The steady decline in the consumption of HDPE bags experienced since 2002 ceased during 2007, and consumption of bags increased by 17% to 3.93 billion in 2007. Overall however, plastic bag use has still fallen by 33.9% from 2002 to 2007[109].

Figure 5. Estimated HDPE bag consumption in Australia, 2002 to 2007 (billions of bags per year)



[7] *Australia's Environment Protection and Heritage Council (EPHC) is a group of Ministers from participating jurisdictions (ie. Commonwealth, State and Territory Governments, the New Zealand Government, and the Papua New Guinea Government).*

NATIONAL APPROACH

The NSW Group Office of Environment and Heritage (2011)[110] for the Government of New South Wales reports that a national process is underway via the Australia-wide ministerial council Environment Protection & Heritage Council (EPHC) that is developing national standards for degradables.[111] The current tranche of work concerns biodegradability in marine and freshwater environments, and on land.

A Consultation *Regulatory Impact Statement* (RIS) in January 2007 found that regulatory options for a phase-out had economic costs which significantly outweighed the environmental benefits. In April 2008, EPHC noted the analysis presented in a Decision RIS on plastic bags,[112] particularly the financial costs of regulatory options, and resolved not to endorse uniform regulatory action at this time, or to ban or place a charge on plastic bags.

For the purpose of the EPHC RIS, a plastic bag is defined as:

> *a carry bag, the body of which comprises polymers in whole or part, provided by the retailer for the carrying or transporting of goods, but does not include a carry bag which complies with prescribed design criteria.*

The prescribed design criteria define features (the presence of any one of which indicates that the bag is **not** a plastic bag) are:

- a thickness greater than 45 microns
- has no handles
- is the product's integral packaging
- is designed for multiple use as a carry bag (i.e. more than ten re-uses).

The EPHC RIS considered four scenarios (against a 2007 base case):

- Option 1: litter management
- Option 2: mandatory retailer charge at point of sale
- Option 3: government levy
- Option 4: ban on plastic bags

While the cheapest option, the litter option is not the most effective at addressing the market failure, the community desire for action, nor the EPHC's commitments to phase out plastic bags. If a mandatory retailer charge were selected as the preferred mechanism, 25c has been modelled as being cheaper for the economy than the 10 or 20c options. The RIS noted that this option has least impact on business of the regulatory options and scores best in the Multi-Criteria Decision Analysis which takes into account a broader scope of variables than Cost Benefit Analysis. Options that substantially reduce plastic bag consumption have a greater chance of reducing plastic bag litter. This is particularly the case where an economic signal makes consumers think before purchasing otherwise 'free' plastic bags.

CONSUMPTION OF PLASTIC BAG ALTERNATIVES

The efforts to reduce the use of lightweight thin-walled HDPE bags has led to increased use in alternative forms of shopping bags. Since the introduction of the reusable 'green' bag into the Australian retail market in 2002, their use as a retail bag has surged rapidly. The most commonly used reusable bags are manufactured from polypropylene.

Based on shopping observations undertaken by Hyder Consulting,[113] 13% of transactions in stores that do not charge for thin-walled bags involved the use of a designed for purpose reusable bag. A further 15% of transactions did not. Within stores that charge a fee for thin-walled bags provided, 33% of transactions involved a reusable bag and 40% of transactions did not. This seems to indicate that the introduction of bag charges at a retail level does lead to a major shift from thin-walled bags to reusable bags or no bag transactions.

Hyder noted that it is often argued that the environmental gains achieved through a reduction in the consumption of plastic bags could be reduced or offset by the environmental impacts of increased use of plastic bag alternatives such as kitchen tidy bags. An analysis of kitchen tidy bag sales growth over the period 2002 to 2006 was undertaken to provide a comparison of the relative change in plastic bag use and the number of kitchen tidy bags sold in units and tonnes.

The analysis presented in Table 7 indicates that the reduction in the use of plastic shopping bags significantly outweighs the increase in kitchen tidy bag sales.

Table 7. Comparison of change in plastic bag and kitchen tidy bag use (Australia, 2004-2006)

	2004	2005	2006
Decrease in HDPE bag use from previous year (million)	*510*	*810*	*560*
Decrease in HDPE bag use from previous year (tonnes)	*2,777*	*4,498*	*3,455*
Increase in kitchen tidy bags sold from previous year (million)	*26*	*31*	*38*
Increase in kitchen tidy bags sold from previous year (tonnes)	*251*	*300*	*364*
Net change in materials use (tonnes)	*-2,526*	*-4,198*	*-3,091*

SOUTH AUSTRALIA

In 2009 South Australia led the nation with a ban[114] on lightweight, checkout-style plastic bags.

South Australian shoppers were quick to embrace the State's plastic bag ban. Research undertaken by the Ehrenberg-Bass Institute for Marketing Science at UniSA showed that more than nine in ten shoppers took reusable bags to do their shopping, compared to about six in ten before the ban took effect.

With this South Australian Government initiative there are almost 400 million fewer plastic bags in South Australia every year.[115]

Since 2006 the Government has worked with retailers and unions to promote a smooth phase-out of the bags and to ensure risks for retail workers are minimised. Zero Waste SA worked with a task force comprising major retailers, the State Retailers Association of South Australia, Hardware Association of SA Inc., Restaurant & Catering SA, Consumers' Association of South Australia, Conservation Council, Local Government Association, KESAB environmental solutions, and the Shop Distributive & Allied Employee's Association. The ban[116] prohibits retailers from selling or giving away plastic bags with handles made of PE less than 35 microns thick. Thin-walled plastic bags which are marked 'degradable' are banned because degradable plastics merely break down into smaller and smaller flakes. Only compostable bags that comply with Australian Standard AS4736-2006 are permitted.

Retailers are protected from unknowingly buying banned bags and supplying them to their customers. If a supplier provides a retailer with bags they know are banned, they will be guilty of an offence (maximum penalty: A$20,000). Every retailer in South Australia must comply with the transition and ban dates. Large and small retailers, supermarket and non-supermarket retailers, markets, take-away food and specialty shops must all comply with the ban.

AUSTRALIAN CAPITAL TERRITORY

In December 2010, the ACT Legislative Assembly passed legislation to ban lightweight plastic bags in the ACT. The *Plastic Shopping Bags Ban Act 2010*[117] comes into effect on July 1, 2011 when a four-month transitional period will begin to allow residents and retailers time to adjust to the ban, which begins on November 1, 2011.

The announcement followed a comprehensive study of community attitudes towards the use of plastic bags in the retail environment carried out in August 2009[118].

WESTERN AUSTRALIA

In April 2010, the *Plastic Shopping Bags (Waste Avoidance) Bill* 2010[119] was introduced into the state's Legislative Council, with the aim to ban thin-walled plastic shopping bags.

NORTHERN TERRITORY

In February, 2011 Australia's Northern Territory Legislative Assembly passed a law to ban plastic shopping bags, with a phase-out starting in May, 2011 and the ban becoming fully implemented on September 1, 2011.[120] The *Environment Protection (Beverage Containers and Plastic Bags) Act 2011* is an element of the $34 million *Northern Territory Climate Change Policy*[121] released in December 2009.

Based on national consumption rates, approximately 40 million lightweight thin-walled plastic bags are currently used in the Territory each year. Gains made in reducing consumption through voluntary, co-operative arrangements have now been achieved. The Territory Government believes that greater intervention is now required to stabilise or further reduce consumption.

The ban will prohibit retailers from selling or giving away lightweight plastic bags designed for single use. The Territory will follow a similar approach to South Australia. Northern Territory legislation will prohibit the supply by retailers of plastic bags with handles that are made of polyethylene polymer less than 35 microns thick.

In the Territory, the ban will not extend to:

- reusable 'Green bags' (heavy PP bags designed to be reused over 100 times).
- recycled bags you bring along yourself.
- heavier retail (or boutique) bags, typically used by clothing and department stores.
- biodegradable bags that state they meet Australian Standard AS 4736-2006
- barrier bags, the type dispensed from a roll, typically for items such as loose fruit and vegetables.

VICTORIA

State agency Sustainability Victoria was established by law as a state agency in 2005. It has not adopted an interventionist stance on plastic bags, preferring to take an encouraging role with a '*Use less bags*' campaign.[122]

AUSTRALIAN NATIONAL RETAILERS ASSOCIATION (ANRA) PLASTIC BAG CHARGE TRIAL

In 2008 KPMG were commissioned by Australian National Retailers Association (ANRA) to provide advisory assistance in connection with the trial of a Victoria state Government and Industry charge on plastic bags[123]. This trial was conducted in the four week period from August 18, 2008. The quantitative and qualitative data collected focused on testing five hypotheses:

- **Hypothesis 1**: A 10 cent levy for plastic bags at supermarket checkouts reduces bag consumption by 80%
- **Hypothesis 2**: A 10 cent levy does not change customer shopping habits, i.e. encourage customers to shop elsewhere
- **Hypothesis 3**: The 10 cent levy is likely to cause a long term change in customer behaviour with regard to shopping bag usage
- **Hypothesis 4**: customers use checkout bags as bin liners and a reduction in use will stimulate demand for bin liners
- **Hypothesis 5**: customers and checkout staff are not aggrieved by the introduction of a levy.

The trial concluded that there was a 79 per cent reduction in the use of plastic bags with the 10 cents charge. This does not necessarily equate to 79 per cent fewer people using these bags, as some customers and staff observed more items being packed into each bag.

Of the customers surveyed, 91 per cent responded that they had tried reusable bags, and 70 per cent of these claimed to have made it a habit. Some 87 per cent of respondents indicated they would use reusable bags if the 10 cent charge became permanent. KPMG noted that there was strong support (45 per cent) for a ban on plastic bags.

QUEENSLAND

In 2010 the state of Queensland issued a Waste Reduction and Recycling Strategy 2010–2020[124] which set a number of targets, including:

- reduce waste to landfill and landfill gas emissions
- increase recycling of municipal solid waste recycling to 50 % by 2014
- recycle 150 kg household waste per person per annum by 2010
- reduce total amount of litter

Household waste reduction initiatives included educational campaigns based on the waste hierarchy and focusing on consumer purchasing decisions and plastic bag reduction. This is the only mention of plastic bags as a state-level priority issue.

TASMANIA

On November 10, 2010 the Tasmanian Government's Minister for Environment, Parks and Heritage, David O'Byrne, committed to taking a proposal to Cabinet to implement a ban on lightweight plastic bags.[125] He said the Government's preference had always been for a national approach to addressing plastic bags, but the federal Environment Protection and Heritage Council had been unable to reach a resolution.

Through the Environment Protection Authority's Waste Advisory Committee, the Tasmanian Government began initial consultation with local government, industry and the community on potential ways to reduce the waste going to landfill and increasing opportunities for recycling.

NEW SOUTH WALES

In 2011, the **New South Wales Department of Environment, Climate Change and Water** (DECCW) published a review of waste strategy and policy (DECCW, 2011).[126] Within this, the Total Environment Centre (TEC) was commissioned to examine the issue of 'problem' wastes that contaminate recycling materials. TEC has identified the main contaminating materials, ranking them by impact, and suggested policies and practices to address each of the priority contaminants.

TEC recommended a possible ban on non-degradable plastic bags for organics collections. Other possible actions suggested for plastic bags included developing a standard to ensure plastic bags are biodegradable, mandating biodegradable bags and using public education to reduce the use of plastic bags around recyclables. In NSW, both degradable and non-degradable plastic bags are in use. This may result in cross-contamination i.e. non-degradable bags mixed with degradable (compostable) bags, lowering the quality of the compost products, while degradable bags mixed with plastics recycling affect the integrity of the recycled plastic material.

DECCW (re-christened **Office of Environment and Heritage** in April 2011) also published an implementation strategy.[127] Office of Environment and Heritage (OEH) confirmed (2011)[128] that the NSW strategy includes accelerating the introduction of compostable bin bags for food waste to enable streaming with garden waste collection, and phasing out the use of non-compostable bags (other than reusable bags) in food and grocery outlets.

BANGLADESH

PLASTIC BAG BAN IN DHAKA CITY, BANGLADESH

A survey report[129] showed that some ten million PE bags were used every day. Each year about 3,000 million bags were dumped in Dhaka City alone. Some 14.1 billion bags used to be used annually in homes in Bangladesh, before these bags were banned in 2002.

The steadily growing use of polyethylene bags led to severe environmental impacts such as soil degradation, loss of soil fertility, blocking of drains and sewers, causing water-logging and the spread of disease.

The anti-bag campaign reached its peak in the aftermath of the 1998 flood, when two-thirds of the country, including a large part of Dhaka City, was under water for nearly two months. Clogging of city drains by PE bags was a contribution. In 1999, Ministry of Environment started an action against polyethylene through its Sustainable Environment Management Programme (SEMP), that led to the formation of a Task Force by the Government under the Ministry to work towards framing a strategy to phase out polythene shopping bags. The Task Force recommended undertaking a detailed study on the production, marketing and use of PE shopping bags including on its socio-economic impacts before making the final decision.

The Ministry then started a vigorous campaign from market to market for sensitisation and motivation and announced that January 1, 2002 shall be the cut-off date for production and use of 20 micron thick PE shopping bags.

NATIONWIDE BAN

The national Government decided to ban production and use of all kinds of PE shopping bags from March 1, 2002. The bill was passed without any opposition. This bill revised the *Environment Conservation Act 95*, stating that (Section 6a):

> *If, on the advice of the Director General or otherwise, the Government is satisfied that all kinds or any kind of PE shopping bag, or any other article made of PE or PP, or any other article is harmful to the environment, the Government may…issue a direction imposing absolute ban on the manufacture, import, marketing, sale, demonstration for sale, stock, distribution, commercial carriage or commercial use, or allow the operation or management of such activities…*

Reazuddin et al concludes that banning PE bags has been a success. Now the city bins and garbage dumping sites are almost free of polythene shopping bags. The city drains are no longer clogged. Growers are happy to see that demand for jute products in the domestic markets is going up. PE shopping bags manufacturers have since been engaged in the production of alternative bags and many jobs have been created.

BERMUDA

Bermuda may impose a nationwide ban on plastic bags, Deputy Premier Derrick Burgess revealed (November 13, 2010).[130]

He told the House of Assembly that the bags had a lifespan of up to 400 years and caused serious harm to the environment. "We are proposing to ban plastic bags," he said.

BOTSWANA

COMPARING TAXATION AND REGULATION OF PLASTIC SHOPPING BAGS IN BOTSWANA AND SOUTH AFRICA

American think-tank Resources for the Future (RFF) reported (2010)[131] that disposable shopping bags have

become a feature of life in Botswana since 1975, when they were first widely issued. In South Africa, they have been issued to shoppers free of charge at most major supermarkets for even longer. This long-term, widespread use has resulted in a negative visual externality: no one is responsible for the used bags littering urban streets and catching on fences in rural areas. However, RFF noted that documented cases of wild and domestic hoofed animals, such as goats and pigs, dying as the result of ingesting plastic bag remnants are surprisingly rare, given the public profile of this issue.

Following NGO and public pressure, Botswana intervened in 2007 to cut the use of the lightweight disposable plastic shopping bags that were formerly distributed free of charge at supermarkets. Four years earlier, in May 2003, South Africa had introduced similar legislation regulating the gauge of plastic used in plastic bags, and requiring open payment for them at checkouts.

WHAT INTERVENTIONS TOOK PLACE AND HOW SUCCESSFUL HAVE THEY BEEN?

In an attempt to answer these questions, RFF sought details regarding the number of bags issued monthly, the sizes of the bags, and the prices charged from the four major retail chains in South Africa and Botswana. Because each of the four chains target a different income group, the data gave some sense of the income elasticity of demand for plastic shopping bags, as well as the price elasticity.

In both countries, the legislation had begun by trebling the minimum gauge of plastic used. The resulting bags could be loaded more heavily without bursting, and could withstand far more re-use. In Botswana particularly, the focus of policy was not merely on curbing the number of plastic bags issued, but on encouraging recycling, reducing plastic litter, and ensuring the safe disposal of residual plastic waste. The private sector agreed to aid the process by not distributing bags without charging, though the prices levied varied.

RFF's key finding was that charging for bags had a far greater impact in the short run than in the long run. Indeed the actual price charged was less important than the act of charging, a finding that held true over the entire range of prices being levied. Moreover, this effect seemed relatively insensitive to the incomes of consumers.

The initial impact of levies was also far greater than that of subsequent price increases. Conventional utility theory, which presumes that people act rationally, gives little help in explaining this pattern of behaviour. More useful might be prospect theory—or at least the endowment effect, the notion that people attach an irrationally high value to things they see as theirs by right, especially when these are threatened. The public may have seen free bags as a right and therefore reacted against paying, irrespective of the price. Once they had become accustomed to paying for plastic bags, the price became relatively insignificant as, for most of them, the price of the packet was low relative to the cost of the purchases made and carried in it.

In order to estimate consumer responsiveness to these levies, it was necessary to normalize the use of bags for the volume of purchases and for the volume of the bags used. The result can then be expressed as the real value of purchases per bag. Any increase in this figure indicates success in the policy. The impacts of the charges have varied across counties and across time. In Botswana, the charge appears to have been more successful than in South Africa, albeit the charge has been in effect a far shorter time.

Simply showing the number of bags issued could misrepresent the impact of the charges over time, since the volume of retail sales also drives the demand for bags. Accordingly, the effect of the 2007 legislation and charges is represented using an index comprising the number of bags issued by each of the four major retail chains, divided by the real value of their sales.

In South Africa, the impacts of the charge have been far less clear cut. Surveys of consumer behaviour indicate that relatively few are reusing the bags to shopping; instead, they are being used to carry household waste.

Recycling waste-contaminated bags is economically unfeasible. In this respect, the new legislation has not been successful. Moreover, data from three of the four retail chains indicated that, despite the charges, bag use increased once consumers had become accustomed to paying for them.

Figure 6. Index of shopping bags issued (South Africa)

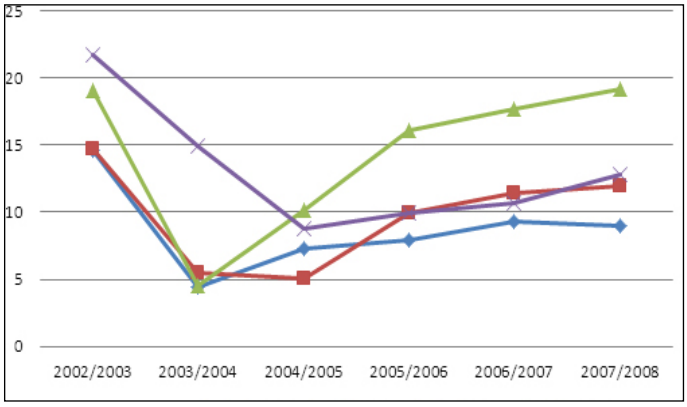
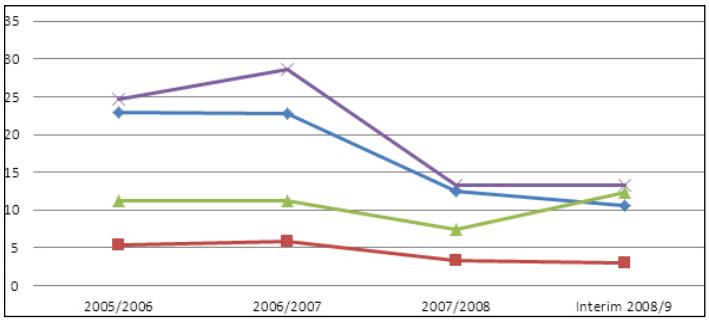


Figure 7. Index of shopping bags issued (Botswana)



RFF's findings identified two interesting aspects of the problem:

- first, when levying charges for plastic bags, consumer sensitivity to the charge declined over time; that is the sensitivity of plastic bag demand to price was less in the long run than in the short run.
- second, both the very poor and very rich have revealed a willingness to pay for good heavy duty plastic bags.

It can be seen that in both Botswana and South Africa, shoppers in retail outlets that target low-income consumers demand just as many if not more bags per $100 worth of shopping. Two reasons have been postulated. One is that, not having cars, and typically living at a distance from the retail outlets, they do not shop in bulk, but buy small amounts as and when needed. Their bags are therefore less fully filled.

Another reason is that, when buying similar products of similar volume, the poor are likely to buy the cheaper item. The results are clear: in both countries the plastic bag charge has been clearly regressive.

South Africa and Botswana's experiences with regulation and taxation of plastic bags may offer useful insights for other LDCs (least developed countries). Certainly their experiences suggest that long-run reduction of plastic bag use may be more difficult to achieve in LDCs than it has been in first-world economies, such as Ireland or Denmark, where ecologically aware consumers pushed for the legislation and were already accustomed to waste sorting and recycling.

In retrospect, it is unclear whether or not the threefold increase in the gauge of plastic being used was warranted. It is also clear that publically displaying the price of bags and stressing the payment may make the tax more effective.

The particular interest of Botswana's experience lies in its voluntary roots. This was legislation that the public wanted. In South Africa, it had long been noted that it was stores targeting the very poor (and the very

affluent) that issued heavy-gauge bags. Despite the regressive nature of charges, opposition to the regulation and pricing of plastic shopping bags did not come from the poor in either country.

In the absence of price competitive biodegradable packaging, regulation and taxation of plastic bags may appear to offer a feasible short-term solution, even in LDCs, to the problem of plastics in the environment. The South African experience, however, suggests that consumers adjust to such taxes and charges, and in consequence these may provide only a limited solution in the long run.

BRAZIL

In Brazil there is no current legislation.[132] A bill was introduced in March 2007, the Chamber of Deputies (PL-612/2007), which promotes the replacement of conventional bags with biodegradable bags in retail outlets throughout the Brazilian territory.

Also in March 2008 the Ministry of Environment launched the '*Consumer Aware Embalagens'* (conscious consumption of packaging), with the exhibition '*Best practices and innovations in packaging'* organised in Brasilia as a starting point for education work that will spread throughout Brazil.

SÃO PAULO

The São Paulo state government in Brazil plans to ban the use of plastic bags in supermarkets by the end of 2011. Under an agreement signed by the state government and the Paulista Association of Supermarkets (APAS), supermarkets will stop distributing the bags and instead sell bags that are biodegradable or reusable.

Plasteurope[133] reports that the move has been criticised by plastics associations, including Plastivida (São Paulo), a national industry association which promotes the responsible use of plastics. In a joint statement, Plastivida, the National Plastics Institute and Brazilian flexible plastic packaging industry association ABIEF said that consumers should not be penalised unnecessarily through charges for plastic bags. It is not the plastic bags themselves that are causing the environmental problems but their incorrect disposal, they stated. This problem needs to be addressed by educating people about how to use, re-use and dispose of the bags.

CANADA

The Canadian Government (2008)[134] estimates that Canadians take home an estimated 2.86 billion plastic bags per year. There is no national legislation in Canada governing plastic bags (Natural Resources Canada, 2011).[135] This would generally be controlled at the provincial level in Canada, though there are municipal (i.e. more local) initiatives, partly because litter issues generally fall to them although the highways and byways between municipalities are a provincial responsibility.

Several different initiatives concerning plastic bags are underway. These include outright bans, phasing out of plastic bags and replacing them with bags of other material, charging a fee per bag (an 'eco-charge'), and education measures. These actions are being undertaken by consumers, retailers, organisations and municipal and provincial governments, either through their own initiatives or in partnership with others.

CANADIAN LOCAL AUTHORITY INITIATIVES

The Federation of Canadian Municipalities[136] lists some examples of local authority initiatives on plastic bags.

TOWN OF LEAF RAPIDS, MANITOBA - PLASTIC BAG BAN BYLAW (2007)

In 2007, Leaf Rapids became the first community in North America to ban thin-walled plastic shopping bags with *Bylaw 462*. The bylaw[137] prohibits retailers from giving away or selling thin-walled plastic bags and levies a fine of up to C$1,000 for anyone found in contravention of the bylaw.

CITY OF TORONTO, ONTARIO - PLASTIC RETAIL SHOPPING BAGS BYLAW (2009)

With *Bylaw 356-2006*[138] the City of Toronto adopted a new Municipal Code Chapter requiring retailers to charge a minimum of five cents for each plastic retail shopping bag requested by customers or, if plastic shopping bags are not offered, to provide a free alternative such as paper bags or cardboard boxes. Signage about the bylaw requirements must be prominently posted at store checkouts; the plastic bag charge must be recorded on the store receipt, and retailers must accept any reusable containers provided by customers for their purchases.

TOWN OF DEUX-MONTAGNES, QUEBEC - REGLEMENT SUR LES SACS DE PLASTIQUE (2009)

The Town of Deux-Montagnes *Bylaw 1358*[139] bans the distribution and sale of disposable plastic shopping bags for retail purchases. The bylaw is aimed at source reduction and so does not permit substituting compostable bags for conventional plastic bags. This objective is part of the town's 2006 Green Shift initiative, in which the town distributed a reusable bag with the town logo to every household.

TOWN OF ANNAPOLIS ROYAL, NOVA SCOTIA - BYLAW FOR THE ESTABLISHMENT OF MULTI-USE PLASTIC SHOPPING BAGS (2009)

The Bylaw[140] for the *Establishment of Multi Use Plastic Shopping Bags* prohibits retailers from giving away or selling plastic shopping bags intended for a single use. Violators are subject to a penalty of up to C$1,000.

CITY OF THOMPSON, MANITOBA

The City of Thompson has passed *Bylaw Number 1839-2010*. The Bylaw[141] took effect on December 31, 2010 and prohibits the sale or give-away of plastic bags.

The bylaw states specifically: 'No person shall sell or provide thin-walled plastic bags free of charge or allow thin-walled plastic bags to be sold or provided free of charge'. This includes biodegradable bags that are less than 2.25 mm thick. It was reported that the City Council had been considering the ban for many years.

CITY OF SIOUX LOOKOUT, ONTARIO

On September 15, 2010, The City of Sioux Lookout became the first municipality in Ontario to ban plastic bags. Sioux Lookout Municipal Council gave a third and final reading to *Bylaw No. 20-10*[142]. The Council then voted 5-2 to pass the *Bylaw to Prohibit the Sale or Free Distribution of Plastic Bags Within the Municipality of Sioux Lookout*. The intent of the bylaw includes:

- helping to stem the large portion of plastic bags that find their way into the local landfill
- reducing the distribution and use of plastic bags to promote environmental and financial benefits, including decreasing the amount of litter found throughout the municipality and protecting storm sewers from blockages from plastic bags.

The bylaw defines plastic bags as, *'a bag made of plastic film, including biodegradable or compostable bags, provided by a Retail Business to a customer at the till or point of sale to carry customer purchases from the Retail Business'*.

Equally important in the definition of plastic bag is the description of what does not constitute a plastic bag, including: bags used for bulk purchases (eg for produce, small hardware supplies), meat, frozen foods, prepared foods, newspapers, laundry dry cleaning, minnows, and bags sold in packages containing multiple bags intended for such uses as garbage, recycling, pet and yard waste.

The chief voluntary effort comes from the plastics industry. The Canadian Plastics Industry Association (CPIA) is the voice of the Canadian Plastics Industry. With over 3,350 companies employing 106,000 workers, Canada's $31-billion plastics industry supports an active programme of recycling for plastic bags. CPIA notes[143]

that in Canada, 44 per cent of the population (almost 14 million people) have access to plastic bag recycling through kerbside programmes, drop-off depots, or at-store bag take-back schemes.

Plastic shopping bags can be recycled into new bags and other durable products, such as plastic lumber for decking, park benches, picnic tables and waste receptacles. The number of plastic recycling businesses in North America has nearly tripled over the past several years. Whole new product categories are emerging that use recycled plastic shopping bags, such as the composite lumber market, which was valued to reach US$1.4 billion in 2007.

INDUSTRY INITIATIVE

From July 1, 2009 IKEA ceased selling plastic bags in its Canadian stores;[144] the final step in the Company's Bag the Bag programme that launched in October 2007, with charges of five cents a bag. IKEA donated all proceeds (more than $280,000) to Tree Canada.

ONTARIO

Stewardship Ontario (SO) is the industry scheme producer responsibility scheme with an interest in plastic bag. “People may point to China as a leader for its total ban on plastic bags,” said SO’s VP (Operations) Lyle Clarke, “but they don’t have the same recycling infrastructure we have where shopping bags are recycled and highly recyclable. The same holds true in other places that lack the technology to recycle plastic. Here, in Ontario, it’s a far different story. Today plastic bags can be recycled into new bags or a wide variety of plastic products, ranging from flooring and decking to park benches and picnic tables”.

In February 2009, the Toronto Star[145] reported that Ontario shoppers carried home 269 million fewer shopping bags in 2007 than they did in 2006. On the other hand, they still carted off a little more than 4 billion thin-walled bags over the course of the year. That's 316 bags per year for every man, woman and child in the province. And fewer than one in twelve of these found its way into a recycling programme.

Three years ago in Ontario, the Canadian Council of Grocery Distributors (CCGD), the Canadian Federation of Independent Grocers (CFIG), the Recycling Council of Ontario (RCO), the Retail Council of Canada (RCC) and the Canadian Plastics Industry Association partnered the Ministry of the Environment to craft a strategy for achieving a 50% reduction in plastic bag use by 2012.

In Toronto, which imposed a 5 cent bag fee on June 1, 2009, plastic bag use fell by 70 - 75% following introduction of the fee – a finding borne out by reported marked declines in the generation of plastic film.

When Ontario’s voluntary plastic bag reduction task force was first established, Stewardship Ontario reported that close to 60% of plastic bags (2.35 billion at the time) were being reused to wrap garbage, organics or recyclables. Instead of a ban, the Ontario Task Force opted for a multi-faceted approach to reducing plastics use. The group focused on getting more retailers to adopt best practices – phasing out non-recyclable plastics, reducing bag size, using stickers/tape for larger items, encouraging better bagging, making reusable alternatives readily available and promoting in-store or kerbside recycling services.

Plastic shopping bags made of biodegradable or compostable plastic, or plastic bags that have metal fittings (eg eyelet or grommets) or other non-plastic components, such as string, card or cardboard, will be banned for sale or distribution. The move to ban non-recyclable bags is part of the city’s commitment to ensuring a sustainable recyclable product, and ties into Ontario’s agreement to reduce plastic bag use by 50% by 2012. In December 2008, the City of Toronto allowed plastic retail shopping bags into the Blue Bin programme.

BRITISH COLUMBIA

In 2008, British Columbia’s plastic bag reduction initiative came into being through a voluntary agreement between four leading retail industry associations and the Ministry of Environment. This initiative seeks to halve the number of plastic bags distributed in British Columbia by 2013.

The goal of the partnership is to build a strong relationship among the members in order to reduce the use of plastic bags in British Columbia by focusing on the 3Rs hierarchy: Reduce, Reuse and Recycle. A report published in 2009[146] estimated that 790 million plastic bags were distributed in 2007 by grocers, retailers and pharmacies in British Columbia. To achieve the 50% reduction target, British Columbians will need to reduce the number of plastic bags they use by an estimated 394 million.

In 2008, an estimated 723 million plastic bags were distributed in British Columbia, a reduction of 66 million bags, or around 8.4% since the previous year. In addition, British Columbians recycled over 60 million plastic bags using voluntary in-store recycling programmes. So, in total from 2007 to 2008 more than 120 million plastic bags were diverted from landfills. Key factors contributing to this progress towards the 50% reduction target included:

- in-store incentives encouraging reduction and recycling
- improved bagging practices at check-out
- increased availability of reusable bags
- more voluntary in-store collection points for recycling
- greater consumer awareness and, most importantly, consumers changing their behaviour and reducing their reliance on plastic bags.

ALBERTA

Alberta and four of Canada's major retail associations have reached an agreement aimed at reducing plastic bag use across the province.

The retail industry has agreed to implement a strategy to cut plastic bag use in half by 2013, using 2008 as the baseline year. Approximately 900 million thin-walled plastic bags were distributed that year. The strategy is being implemented at industry's expense, and includes education initiatives to promote the use of reusable shopping bags.

NORTH WEST TERRITORY

Since February 2011, all paper, plastic and biodegradable bags have cost 25 cents in all Canada's Northwest Territories (NWT) stores, according to the Province's Government.[147]

Phase 2 of the *Single Use Retail Bag programme* is part of the *Government of the Northwest Territories' (GNWT) Waste Reduction and Recovery Programme Expansion* and is intended to reduce litter on the land and in communities. The 25-cent fee does not apply to bags used inside stores for unpackaged bulk items such as produce, bakery items, candy and small hardware items. It also does not apply to bags used for dry cleaning, prescriptions or primary packaging of prepared food. Fees for thin-walled retail bags have consistently worked to reduce consumption, with higher fees linked to fewer bags purchased. Fees collected from Phase 2 of the programme continue to go into the GNWT's Environment Fund to help pay for future waste reduction and recycling programmes.

The single-use Retail Bag programme (SRBP) is the second programme created under the Waste Reduction and Recovery Act. It was implemented on January 15, 2010 to address millions of disposable shopping bags that cause unsightly litter.

As of February 1, 2011, the *Single-use Retail Bag Regulations* apply to the SRBs distributed by all NWT stores. According to the NWT Government, studies show that when a bag costs 5 or 10 cents, there is an initial drop in consumption, but after some time consumers absorb the additional price into everyday expenses and begin paying for bags. A 25 cent environmental fee will ensure consumers don't become accustomed to the fee and begin purchasing bags. Residents will only have to pay the fee if they don't bring their reusable bags.

All NWT retail stores are included in the programme; this includes clothing stores, convenience stores, hardware stores, hair salons, florists, wholesalers, etc. Restaurants are not included in the programme. Every NWT household will receive two compact reusable bags free of charge.

CHILE

In Chile, although there is no current legislation,[148] a bill was introduced in the House of Representatives in August 2008 which prohibits the use of non-biodegradable plastic bags.

In August 2008 the Minister for the Environment launched a campaign (*More room, less bags*) which aims to reduce plastic bag use by encouraging the use of traditional cloth or paper bags.

CHINA

China banned plastic bags nationwide on June 1, 2008, in a bid to save 37 million barrels of crude oil every year. AFP reported (2011)[149] that around three billion plastic bags were being used daily in China before the 2008 ban. Since then, according to the NDRC [National Development and Reform Commission], people used at least 24 billion fewer plastic bags every year.

China plans to expand its nationwide ban on free plastic shopping bags. IT Wire (2011),[150] citing official China news agency Xinhua, reported that free plastic bags thinner than 25 microns will not be allowed at bookstores and pharmacies. Although China has banned the distribution of free plastic carrier bags at retail outlets (University of Hong Kong, 2011),[151] the level of charge per bag is not stated and outlets are free to impose any amount of levy they want. Also, the revenue is retained by the outlets concerned.

Xing (2009)[152] reports that the Chinese ban on plastic bags consists of two regulations:

- the compulsory national standard of plastic bags - should be no less than 25 microns thick
- the management of compensation for the use of plastic shopping bags in retail establishments requires that the selling price of the plastic bags be higher than operating costs.

In addition, on July 10, 2008 China's Ministry of Commerce, National Committee of Development and Reform, and State Association of Industry and commerce made a joint supplementary provision which expand the scope of application, according to which restaurants and bookshops are included. Xing (2009, ibid) reports that problems in implementation include:

- market-traders continue to provide free ultra-thin plastic bags. Traders often have two kinds of plastic bag, one meets the national standard and is used to demonstrate during inspections, while the other is thinner than 25 microns .
- some businesses still use the sub-standard auxiliary bag (or pre-packaging roll bag), for example, the bags have no such Logo as 'for food use', 'QS', enterprise information, and the thickness is thinner than the required standard.
- there are cases of double-charging consumers
- there is lack of effective substitutes for plastic bags. Non-woven cloth bags are now accepted widely, though these are manufactured from non-biodegradable plastics and will result in increased consumption of non-renewable resources.

HONG KONG

The Hong Kong administration has introduced an environmental levy on plastic shopping bags.[153] The indiscriminate use of plastic shopping bags is reportedly a major and visible environmental problem in Hong Kong. The Government's landfill survey indicates that some eight billion plastic shopping bags are disposed of at landfills every year. This translates into more than three plastic bags per person per day.

To counter the problem of the indiscriminate use of plastic bags, the Government proposed to introduce an environmental levy of 50 cents on each plastic shopping bag at the retail level, with the first phase covering chain or large supermarkets, convenience stores and personal health and beauty product stores. A two-month public consultation conducted in 2007 indicated overwhelming public support for the levy.

The *Product Eco-responsibility Ordinance (PERO) (Cap. 603*) was enacted in July 2008. The Ordinance provides a legal basis for introducing producer responsibility schemes, with the environmental levy on plastic shopping bags as the first scheme under the Ordinance. The *Product Eco-responsibility (Plastic Shopping Bags) Regulation* which further sets out the implementation details of the environmental levy scheme, was approved by the Legislative Council in April 2009. The environmental levy commenced on July 7, 2009.

Under the Levy Scheme, prescribed retailers are no longer allowed to provide free plastic shopping bags; and they must charge their customers an environmental levy for each plastic shopping bag they ask for. Retailers who have successfully registered under the Levy Scheme would become registered retailers and they will:

- have a certificate of registration displayed at each of their registered retail outlets
- have their names and addresses maintained in the Register posted on EPD's website
- display cards and stickers bearing the Levy Scheme's logo.

The Levy

The environmental levy is set at 50 cents for each plastic bag given out at a registered retail outlet. This level is based on public opinion survey as well as previous voluntary campaigns which indicated that a levy of 50 cents would create sufficient incentive to reduce the use of plastic shopping bags on the one hand, but not exceeding a level generally accepted by the public on the other.

Plastic bags subject to the Environmental Levy include those:

- wholly or partly made of plastic (this includes but is not limited to PE, PP, PVC and nylon.)
- with a handle, handle hole, perforated line for tearing out a handle hole, carrying string or strap, or any other carrying device on, or attached to, the bag
- made partly with plastic are plastic shopping bags such as:
- paper shopping bags made partly with plastic such as plastic lamination or plastic handles
- non-woven bags made of polypropylene (commonly known as 'environmental bags')

Plastic bags **NOT** subject to the Environmental Levy include those:

- sold at a price of $5.00 or more
- two or more bags that are sold as a pre-packaged pack at a price of $5.00 or more per pack
- that contains either unpackaged goods or more than one piece of goods; and is sealed before the goods are supplied to the retailer concerned
- that do not have a handle (eg those commonly offered for wrapping fruit, seafood, or bakery)

CONGO

The Republic of Congo has banned the production, import, sale and use of plastic bags in a move to fight environmental pollution in the Central African nation, government spokesman Bienvenu Okiemy said, according to Reuters (2011).[154]

Okiemy said that the government had adopted a decree which prohibits the use of plastic bags to pack food, groceries, water and other beverages. He did not say when the ban would become operational. Congo, like many developing nations, lacks adequate waste management and recycling facilities. The widely used non-biodegradable plastic bags are strewn about, causing harm to the environment.

GHANA

Ghana's Vice President Mahama has called on African leaders to rise up and join hands to address the waste plastics in African cities (GNA, 2011).[155]

"Plastic waste would continue to be a major cause of flooding in our cities and there is the need for us as leaders to rise up and do something immediately to ensure that the cities were developed", he emphasised.

INDIA

On March 29, 2011, despite reservations by India's national Environment Minister Jairam Ramesh regarding complete prohibition of plastic bags in the Capital, the Delhi Government decided to impose a blanket ban on the manufacture, sale, storage and usage of plastic bags.[156]

The Delhi Government is pushing for a complete ban on use and manufacturing of plastic bag while the Environment Ministry advocates for a partial ban. The Ministry is unhappy with the Delhi Government's decision to impose a complete ban on manufacture, sale, storage and usage of plastic bags.

According to the Cabinet proposal, mooted by Secretary (Environment, Forests and Wildlife) Dharmendra, there would be a complete ban on the manufacture, sale, storage and usage of all kinds of plastic bags including non-woven plastic bags in the Capital and repealing of the existing *Delhi Degradable Plastic Bag (manufacturing, sale and usage) and Garbage (control) Act 2000*. The Delhi Government had banned the use of plastic bags in Delhi in January 2009, and the rules provided for punishing defaulters through a fine or jail term, or both. Authorities have since then raided shopping outlets and malls and prosecuted shopkeepers providing plastic bags, with some being fined up to R1 lakh (EUR1,526).

Meanwhile, the Finance Department has raised questions over the proposal saying the department is silent as to whether it would lead to any financial implication to the Government especially of banning of the plastic bags manufacturing units in the city and its relocation, if any and rehabilitation of the workers if any. In its reply to the Finance Department, the proposal suggested that there be no financial implication due to the proposed ban.

On the other hand, the Environment Ministry is against a blanket ban on the use of plastic bags as no other cheaper option is available as compared to cloth, jute and paper bags. The Ministry has issued a notification banning plastic bags below 40 microns. Previously, there had been a ban on plastic bags thinner than 50 microns. On April 30, 2010, a national expert group was constituted[157] to examine the draft Plastic Rules, 2009 and to make recommendations based on the comments received and international experience. The group would also examine economic instruments to promote environment friendly alternatives to plastic bags.

In February 2010, the Government of India issued a status report[158] on actions taken to counter problems caused by lightweight plastic shopping bags. Various States have increased the minimum thickness of plastic bags to even higher limits of 40, 50, or 70 microns. These States or Urban Territories are:

- Goa: 40 microns
- Himachal Pradesh: 70 microns (statewide ban from August, 2009)
- Maharashtra: 50 microns
- Meghalaya: 40 microns
- Punjab: 30 microns
- Chandigarh: 30 microns
- West Bengal: 40 microns
- Kerala: 30 microns.

Delhi, India, one of the most populous cities in the world at nearly 14 million people, would follow suit[159]. The cities of Dhaka (Bangladesh), Mumbai, the western Indian states of Maharashtra and Himachal Pradesh already had bans in place to prevent storm drains being clogged during the monsoon season. In January 2009, the whole of the capital city - Delhi and its suburban expansion, New Delhi instituted a city-wide ban on the bags, which were reportedly implicated in the 2005 floods that killed hundreds in Mumbai.

The Government of Delhi issued a notification dated 21st November 2008 entitled *The Delhi Degradable Plastic Bag (Manufacturing, Sale and Usage) and Garbage (Control) (Amendment) Act, 2008*. Section 11(b) stipulates that no person shall manufacture, stock, distribute or sell plastic bags made of virgin or recycled, degradable or non-degradable plastic bags which are less than 40 microns in gauge.

Another notification issued on January 7, 2009 under the powers delegated to Government of Delhi by the *Central Government under Section 5 of the Environment (Protection) Act, 1986*, which prohibits the use, sale and storage of all kinds of plastic bags in Five Star and Four Star hotels, hospitals with more than 100 beds, except the use of plastic bags as prescribed under *Bio-medical Waste (management and handling) Rules*.

West Bengal Pollution Control Board has banned the manufacture, sale and use of plastic bags in ecologically fragile areas (such as the Sunderban areas, hilly areas of Darjeeling), forest areas and different heritage and tourist sites. Action has been initiated for public awareness (trainings, workshops) for plastic waste management such as proper disposal of plastic bottles, banning of plastic bags, use of cloth/jute bags etc.

Coloured plastic carrier bags have been banned in Himachal Pradesh. Use of plastic bags has been banned in some districts in Mizoram/West Bengal, Jammu, and Kashmir has also banned polyethylene bags under the *Non Biodegradable Material (Management, Handling and Disposal) Act, 2007* - effective from May 11, 2009.

HIMACHAL STATE WINS NATIONAL AWARD FOR PLASTIC WASTE MANAGEMENT

In April 2011, for its sustained campaign against usage of plastic bags, the Indian state of Himachal Pradesh was conferred with Prime Minister's Award for Excellence in Public Administration for 2009/10.[160] The Government of the State of Himachal Pradesh banned plastic bags in Himachal Pradesh under the *HP Non-Biodegradable Garbage Control Act, 1995*[161] effective from August 15, 2009.

The State intends to enforce a complete ban on plastic cups, plates and tumblers from August 15, 2011. A State-sponsored '*Polythene Hatao Paryavaran Bachao'*, has involved NGOs, government departments, institutions, panchayats (groups of respected elders chosen and accepted by their communities), urban local bodies and rag-pickers to collect waste PE garbage.

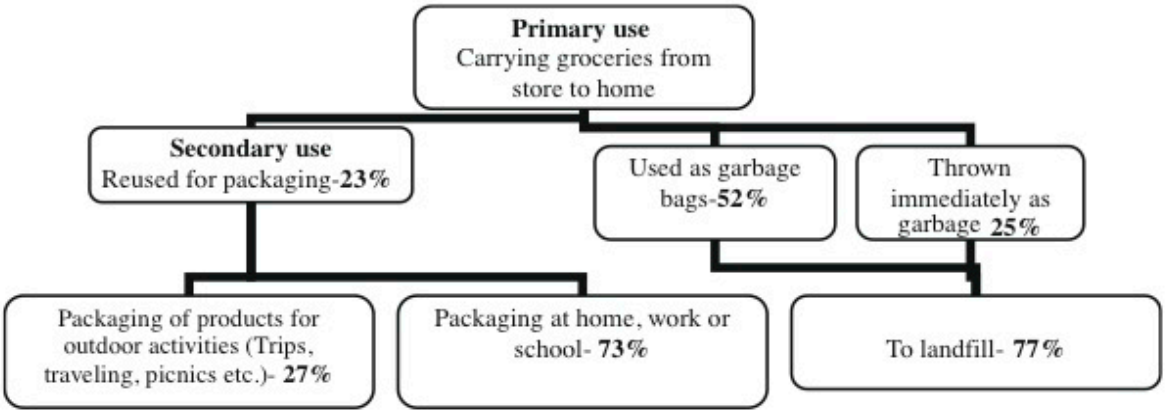
The government offered a buy-back scheme for the waste plastic at Rs 3 (EUR0.05) per kg, which was then shredded and mixed with bitumen for road surfacing. More than 300 tonnes of plastic waste were collected and used to surface 300 km of roads.

ISRAEL

Ayalon et al (2009)[162] report that two billion carrier bags in Israel are used each year. Plastic carrier bags are provided free of charge so there is a tendency to use these bags excessively.

A survey revealed that 6% of these bags, 120 million bags annually, are used for outdoor activities (such as carrying picnic food) and might become litter, if left outside and not disposed of properly.

Figure 8. Routes of plastic bags use and disposal.



The analysis of the suggested regulative mechanisms indicates that they would not be effective. If these regulations are imposed, the value of the benefit taken from the public is very high, in the case of a NIS 1 levy (EUR0.20) per bag, NIS 250 million (EUR50 million) annual decrease in consumer surplus, but the benefit to the environment is limited. Therefore, the authors concluded that implementing either a levy or a prohibition of plastic bags would not contribute to sustainable waste management or to a rational environmental policy.

Following a presentation of the research findings to the Internal Affairs and Environment Committee of the Israeli parliament, the legislative proposal was changed, and now calls for prohibition of free plastic bags. The retailers will also be required to sell multi-use bags and an Israeli standard will be developed to define the minimal quality (strength and size) of the product.

In addition, the study strongly recommends combining explanatory and educational measures encouraging the reduction of unnecessary consumption of bags, as well as the importance of refraining from leaving litter in open spaces and using multi-use bags in outdoor activities.

In addition to educational activities, also technological measures play a role in reducing plastic bags consumption (eg designated machines that allow pulling one bag at a time). Encouraging bag collection for recycling may also contribute to a reduction of littering.

JAPAN

Japan's Environment Ministry (2010)163 has supported voluntary initiatives to restrict plastic bag use. A national scheme for 3Rs eco-points has been put forward. For example, *Gifu Eco-life Promotion Project* provides eco-points to people who co-operate in efforts such as reducing plastic bag consumption, bringing one's own chopsticks to restaurants, promoting simple packaging.

This scheme is coupled with two cities and nine towns in Seino region, and five cities and three towns in the Gifu region. Participants can redeem points for eco-goods and more than 800 shops have co-operated in this effort.

Japan for Sustainability reported (2009)[164] that the Nagoya City government in Aichi prefecture planned to charge shoppers for plastic shopping bags throughout the city, although the city government initially planned to launch the programme in 2010.

In Midori Ward, which started a pilot scheme in October 2007, the ratio of plastic shopping bags refused by customers was 89 per cent over a one-year period. This was equivalent to about 31 million plastic shopping bags. This result has accelerated the implementation of the scheme throughout the city.

JORDAN

Each year, about three billion plastic bags are used in Jordan, according to Abu Dhabi's newspaper The National (2010).[165]

Plastic bags are commonly used in Jordan mainly because of their cheap production cost, which hovers between 0.10 and 0.30 fils (EUR0.00010 - 0.00030), according to the Ministry of Environment. Safeway spends US$1 million a year on 350 tonnes of plastic bags, according to the company's chief commercial officer in Jordan.

The government is intent on cutting down on the use of plastic bags. "A draft policy is in place," said Mohammad Khashneh, the director of the chemicals and waste management directorate at the environment ministry. "One of the scenarios is to impose taxes on plastic bags. We have not specified the taxes though, but this measure requires cabinet approval."

KENYA

On January 6, 2011, Kenya took steps to ban plastic bags thinner than 60 microns. Kenya's National Environment Management Authority (2011)[166] has noted that the landscape is blighted with 'artificial flowers' of varied colours, due to poor management of plastic bags.

NEMA appreciates the role played by the Minister for Finance in the Finance Bill 2007, *Kenya Gazette Supplement No. 60 (Bills No. 26)* which proposed:

- banning the manufacture and import of plastic bags of less than 30 microns
- imposing a 120% excise duty on all sacks and bags.

NEMA has directed Kenya Bureau of Standards (KEBS) to revise upwards the standard gauge of plastic bags and wrappers from 30 to 60 microns, the East African Community Standard. NEMA recommends the following tips to reduce the need for plastic bags:

- use bags made from cotton, sisal, corn, paper and cloth
- recycle plastic bags for various purposes, like holding garbage, instead of purchasing new ones.
- take previously used bags when going shopping or using a sturdy bag
- don't take anything with a wrapper that will directly end up in a bin such as plastic wrapping on air time scratch cards
- use and re-use of large plastic sacks whenever possible
- refrigerate food in containers rather than plastic bags.

NEMA further calls upon all stakeholders to support the increase in gauge of plastic bags with a view to conserve and protect the environment for posterity.

MACEDONIA

Macedonia has revealed that it intends to ban plastic shopping bags, prompting a switch to biodegradable bags by 2013 (2011).[167]

The Balkan republic of Macedonia outlawed the issue of free plastic bags by retailers in January 2009. Since then, shops have either charged for them or provided paper bags instead. Shoppers must pay one Macedonian denar (EUR0.016) per plastic bag, according to regional press reports. In the past two years, the use of regular plastic bags in Macedonia has fallen by 40 – 50%. A change to the production of 'green' recyclable plastic bags will not present major difficulties for the 25 companies that manufacture plastic bags in Macedonia.

MALAYSIA

There are no national, Federal initiatives on plastic bags in Malaysia.

The *No Plastic Bag* campaign introduced by the Selangor government (one of the 13 states of Malaysia) has netted RM274,000 (EUR62,245) from consumers who have to pay 20 sen (EUR0.045) for each plastic bag they use at retail outlets. The Star (2011)[168] reports that more than one hundred hypermarkets, supermarkets, pharmacies, convenience stores, bookstores and other retailers are taking part in the campaign.

MEXICO

There are no national initiatives relating specifically to plastic bags in Mexico. In March 2009, Mexico City legislators approved a bill that would punish store owners or operators (with 1.5 days in jail and fines of about US$77,400) for giving customers plastic bags.

The International Herald Tribune (2009)[169] reported that the bill would exempt biodegradable plastic bags. The bill still must be signed into law by the city's mayor.

In a press statement, the city legislature estimated that the average city resident uses 288 plastic bags per year. Currently, Mexico City and the metropolitan area use 20 million bags per day.

Modelled on bans in China and San Francisco, the restriction states: "*No commercial establishment may give away a plastic bag for transporting, handling or packaging their products*". The strict law applies to all stores, including dry cleaners, which will no longer be able to return clothing in plastic covers.

By early 2009, Wal-Mart Mexico,[170] the nation's largest retailer, Mexico's national association of retailers had begun working with its plastic bag suppliers to come up with a substitute. In 2008, Wal-Mart set itself the goal of halving the number of plastic bags it issues across Mexico by 2013. The retail chain plans to gradually reach that goal by handing out 237 million fewer bags each year.

By August 2010, it appeared that the Mexican capital's anti-plastic bag legislation was proving tough to implement, and the law may be modified sooner than the plastics industry expected. Plastic News (2010)[171] reported that the city's environment minister, favoured recycling to solve the capital's garbage problems.

NEW ZEALAND

Hurunui Recycling (2011)[172] advises that New Zealand has no national policy on reducing plastic, and local authorities have no authority to ban plastic bags.

Rhian Tough (2007) in a thesis for a master's degree[173] cited a study suggesting that New Zealanders consume 244 million plastic shopping bags each year (or around 61 each per year). However, she also referenced other sources which give estimated annual figures of up to 372 bags per person.

NEW ZEALAND PACKAGING ACCORD 2004

On August 10, 2004, Plastics New Zealand became a signatory of the New Zealand Packaging Accord[174], a voluntary agreement between Government and Industry to improve the sustainability of the packaging in New Zealand. This Accord included a target whereby major NZ brand owners & retailers committed to reducing plastic shopping bag usage by 20% by 2008, compared with 2003/4 (adjusted for sales).

Individual retail signatories to the Accord will develop and implement plans in order to achieve national reduction targets for plastic shopping bags, as follows:

- **Reduce** - discourage unnecessary use of plastic shopping bags.
- **Reduce** - maximise the number of items packed per bag, appropriate to item type.
- **Reuse** - provide alternative multi trip/reusable (cloth and plastic) shopping bags for sale in store.
- **Recycle** - provide customer recycling facilities for checkout bags. (Implementation will differ according to type of retail environment.)

In January 2009 , the New Zealand Herald [175] reported that the Packaging Accord 2004 was on track to hit a 20 per cent plastic bag reduction with 144 million fewer bags used each year. By then, 100 million bags had been taken out of circulation, most (86 million) within the previous two years as the campaign to involve shoppers gained momentum.

PHILIPPINES

On April 6, 2011, Philippines Senator Loren Legarda (2011)[176] called for a national ban on plastic bags, with fines in the tens of thousands for violators. Legarda, Chair of the Senate Committee on Cultural Communities, filed *Senate Bill 2759, the Total Plastic Bag Ban Act of 2011*, which prohibits groceries, supermarkets, public markets, restaurants, fast food chains, department stores, retail stores and other similar establishments from using non-biodegradable plastic bags.

The proposed penalty for violators include: a fine of P10,000 (EUR158) for the first offense; P50,000 (EUR791) for the second offense; and, P200,000 (EUR3,162), as well as one year suspension of business permits for the third offence. "Typhoon Ondoy in 2009 clearly showed that plastic bags severely worsened the flooding in Metro Manila and made post-cleanup very difficult," she said.

Plastic-makers targeted by ordinances and other measures prohibiting the use of plastic bags have come up with a new technology they hope will solve the problem of waste plastic bags and also protect employment.

Caloocan 1st District Representative Oscar Malapitan expressed his support[177] to industry for developing a new technology wherein plastic bags biodegrade in a month. An additive is available which, when added to plastic bags, will decay in 30 - 45 days, depending on exposure to sunlight. A bill requires malls, supermarkets, grocery stores, convenience stores and public markets to use oxo-biodegradable plastic shopping bags. The Caloocan lawmaker said that various bills banning plastic products are pending in Senate and Congress, lawmaker said. Local plastic manufacturers have expressed full support for items of proposed legislation and initiatives implementing a plastic bag recovery programme, which they consider preferable to banning plastic bags.

Crispin Lao (2011)[178], president of the Philippine Plastics Industry Association (PPIA), cited *House Bills 496* (the proposed *Plastic Bag Recycling Act of 2010*), and *House Bill 501 (proposed Stores Proactive in Plastic Bag Recycling Act of 2010),* both filed by Aurora Congressman Juan Edgardo Angara.

The two bills promote the reduction of plastics usage, encourage the use of alternative and reusable bags and devise retrieval and recycling mechanisms. Lao said a plastic bag recovery programme could be implemented nationwide only through legislation. Lao stressed that a tax levy, a regulation or ban in the use of plastic bags would not be a positive move, citing its impact on the plastics industry and the poor people. Recycled plastics can become useful products, such as bricks, part of an asphalt mix, fillers for hollow blocks and fuel for cement kilns.

MUNTINLUPA CITY

On January 18, 2011 Muntinlupa City, located on the south end of the Manila metro vicinity, became the first major urban centre in the Philippines to ban the use of plastic bags.[179] *Ordinance 10-109*, which also bans polystyrene containers, is stricter than many laws in other countries in that it prohibits the offering of bags for wet meat and fish products.

Severe flooding in Muntinlupa has been attributed to plastic bags and other non-biodegradable packaging which clog waterways and prevent proper water flow. The ordinance, signed into law by Muntinlupa mayor Aldrin San Pedro, is expected to ease such water-flow problems and to stimulate similar bans throughout the Manila metro area.

However, not all reactions to the ban, which imposes fines and potential prison time, have been positive. In addition to industry opposition, the city's Environmental Sanitation Center must address the public's hesitancy to accept the change. While some contest the ban based on an unwillingness to modify their use of plastic bags, others founded their arguments in business. Many street vendors selling drinks see no viable alternative with which to package their merchandise. Small shops who sell nothing but fresh meat and fish cannot afford the expensive paper often used by larger shops as a packaging substitute for plastic bags, and many consumers cannot afford to purchase reusable bags.

Section 15 of *City Ordinance 10-109* states that violators shall be fined P500 (EUR8), P1,000 (EUR16) and P2,500 (EUR40) for the first, second, and third offences, or imprisonment of not more than six months at the discretion of the court. The mayor has warned that business establishments found violating the law face the risk of having their licences to operate cancelled for up to one year.

The Philippine Information Agency (2011)[180] reported that 90 per cent of materials found obstructing storm drains and waterways were plastic discards, costing the city government P2.3 million (EUR36,000) to remove in 2009.

RWANDA

Rwanda banned the use of plastic bags by shoppers, the environment minister told the BBC in 2006.[181]

Drocella Mugorewera said that anyone using plastic bags is breaking a recent law on environmental protection aimed at cleaning up cities. Shops have been banned from giving plastic bags to their customers and police are reportedly stopping plastic-bag users in the street. Some supermarkets have been closed down for flouting the ban, said environment minister Drocella Mugorewera.

In 2004, thousands of people were encouraged to take the day off work to help pick up some of the plastic bags which littered the country.

SINGAPORE

The Singapore National Environment Agency report (2011)[182] that they ran a campaign 'Bring your bag day' a few years ago where customers paid 5 cents (EUR0.028) for each plastic bag take from a supermarket (on certain days of the week). The money went to an environmental NGO, but the campaign was not deemed a great success.

One of the supermarkets still gives a ten cent (EUR0.056) rebate to those bringing their own bag to the supermarket. There is said to be a greater awareness now and more reusable bags being used - but no national Government policy initiatives in sight.

SOMALILAND

A ban was issued by the country's Ministry of Trade and Industry on March 1, 2005, entitled - *Banning importation, production and use of plastic bags in the country*.

Plastic bag pollution in Somaliland is reportedly prevalent (Begum, 2010)[183] that the bags have been nicknamed *Hargeysa flowers* (after Hargeysa, the capital city). According to government officials, plastic bags have become both an eyesore and a source of environmental problems in Somaliland. Of special concern are the adverse effects on livestock, especially on those that feed on shrubs, and clogging of storm and sewage drains.

The ban is supposedly backed by an awareness campaign. Some assessments indicate that both importation and local production of the bags continue, regardless of the ban.

SOUTH AFRICA

According to a socio-economic appraisal of draft legislation on plastic bags (2003),[184] the consumption of vest type carrier bags is estimated at 160 bags/capita/annum or 880 g/person/y. South Africa also exports a range of bags to the annual value of R80 million (EUR8.1 million).

In May 2003, South Africa introduced a ban on thin plastic shopping bags.[185] Shoppers must either provide their own bags or pay for the new-style, thicker, recyclable bags. Retailers were obliged to comply with the new regulations prohibiting the use of thin plastic bags and encouraging the use of thicker, more durable, recyclable bags.

Consumers were given the option of using their own bags or buying thick-walled plastic bags costing:

- up to 25 cents (EUR0.02) for the 10-litre plastic bag
- 31 cents (EUR0.03) for the 12-litre bag
- 49 cents (EUR0.05) for the 24-litre one.

According to the new law,[186] plastic bags should now be made thicker, above 30 microns, so they can be easily recycled. The Government argued that the move would strengthen the recycling industry, retaining existing jobs and creating new ones. The Department of Environmental Affairs and Tourism (DEAT) had identified littering in general as a problem facing the South African environment, and has focused on the effect of indiscriminate dumping of thin plastic bags , believing that this has contributed greatly to the problem.

The above appraisal found that although an increase in the thickness of bags would stimulate recycling, the increase in recycling would be limited (maximum 10-15% of production) unless other factors that constrain recycling were addressed. The most important factor is the need to create additional demand for recycled polymer. According to the department, those who fail to comply with the new legislation face fines of up to R10,000 (EUR1,019) or one years' imprisonment for first-time offenders, and fines of up to R100,000 (EUR10,190) or imprisonment of up to ten years for repeat offenders.

The South African Government's Department of Environmental Affairs and Tourism quickly declared itself satisfied with the level of public and business co-operation in implementing the new law on the use of plastic bags (2003).[187]

For an interesting comparison of taxation and regulation of plastic shopping bags in Botswana and South Africa, carried out by US think-tank Resources For the Future (RFF), see the section on Botswana.

SOUTH KOREA

In Korea since 1999, there has been a charge for plastic and paper bags in department stores, discount stores, and major shopping markets. The purpose of this charge is to reduce the use of disposable bags. According to the law, each shopping mall must sell the plastic bags and refund the 50 won (EUR0.03) deposit when the customers return their plastic bags.

According to the Korean Zero Waste Movement,[188] when first enforcing the law, it seemed that the use of disposables decreased considerably. As time went by, many customers seemed to become less enthusiastic to receive their refund because it annoyed them to return their used shopping bags, and they start to bear the cost of shopping bags as a matter of course.

The Korean *Green Mileage Campaign* began under the slogan of '*carry a green-bag'* (a shopping basket) with the participation of several Korean celebrities. Korean distributors are promoting Green-bag (a pro-environment shopping bag to reduce the use of plastic bags) to their customers. E-mart, Korea's largest distributor, has prohibited sales of plastic bags and has renting shopping baskets at some branches since February 2009. Other major retailers in Korea were said to be taking an active part in campaigns to reduce plastic bags.

SYRIA

In July 2010, the Syrian Ministry of Environment launched a campaign to cut down on plastic bags.

Where bags litter highways, byways and in a region where camels choke on plastic bags, Syria is joining other countries in the Middle East, such as Lebanon, the UAE, campaigning to ban plastic bags.

According to Syria News[189] as the first step in its campaign '*No to plastic Bags'*, the Ministry of Environment distributed (June 28, 2010) thousands of fabric and paper bags to retailers. The campaign also encourages reuse of paper bags, which have become eclipsed by the popular plastic bags. In the second phase of the campaign, the Syrian Ministries of the Environment and Finance are believed to be planning to impose a tax on the plastic bags in order to make them more expensive, and to discourage their use.

According to this article, the Syrian Ministry of the Environment estimates the consumption of plastic bags in Damascus and its vicinity at 15 million bags per day, though NGOs claim that the actual number is much higher. The Environment Ministry has also been exploring alternatives such as biodegradable plastic bags.

TANZANIA

The Government of Tanzania issued a public notice banning the manufacture, importation, sale, purchase and use of plastic bags thinner than 30 microns (60 microns for juice and water packaging).[190] In 2006, the Government also imposed a surtax on the permitted plastic packaging (i.e. 30 microns and thicker).

These bags were thought to contribute the blocking of drainage ditches and sewers and thus increasing the likelihood of contributing to the spread of diseases such as malaria and cholera. According to a local source (2011),[191] Tanzania's environmental authorities estimated that eight billion bags were being used each year before the ban.

TOGO

The African state of Togo has announced it will outlaw the import and sale of plastic bags from July 2011, in order to protect the environment, picking up on a growing global trend, reports Times Live.[192]

Importers of plastic bags were given a six-month deadline and manufacturers nine months. More than three billion plastic bags are used every year by Lome residents, according to estimates by NGO *Pour un Avenir Ensoleillé* ('*For a Sunny Future*'). Kenya has recently declared a similar ban, renewing an earlier pledge that had failed in 2007. Of all five members of the East African Community (Burundi, Kenya, Rwanda, Tanzania and Uganda), only Rwanda has so far successfully banned all plastic bags since 2008.

TURKEY

According to a waste management report from Turkey's Court of Accounts (2007),[193] a circular was sent by the Ministry to the Governorships on August 1, 2002.

Via this circular, governorships were urged to use alternatives to plastic bags in the major shopping centres. However, such activities have remained relatively limited.

UGANDA

People caught offering plastic bags ('buveera') in Uganda after a ban took effect in January 2010 could go to jail for up to three years, pay a fine of up to sh3 million (EUR858) or both.

New Vision (2009)[194] reported that Christine Akello, an environmental lawyer working with the National Environment Management Authority (NEMA), said the penalties would be provided for in an amendment to the waste management regulations under the National Environment Management Act. The amendment was made when Government banned the thinner plastic bags and will be revised to include all plastic bags. PE bags thinner than 30 microns were banned two years earlier, but implementation was hampered by confusion over which bags were below or above 30 microns. NEMA planned to work closely together with non-governmental organisations to engage in the mobilisation of resources and engage local communities in removing plastic bags waste.

UNITED ARAB EMIRATES

In May 2010, the Ministry of Environment and Water in Dubai issued a ministerial resolution prohibiting printing on non-biodegradable plastic bags.

Gulf News[195] reported that the decision is in line with *Resolution 5/77 of 2009* by the Ministerial Council for Services, which approved prohibiting the use of plastic bags and other plastic products that are non-biodegradable and do not comply with the approved standards. This will be effective from January 1, 2013. In addition, *Resolution number 5/376 of 2009* lists the dangers of printing on non-biodegradable plastic bags.

UAE Minister of Environment and Water noted that, under the new resolution, shops were not allowed to print commercial names, products names, advertisements, and anything else on non-biodegradable plastic bags. The *'UAE free of plastic bags'* initiative was part of the Ministry's objectives to create awareness on the hazards of plastic bags on the environment. The resolution is in line with the ministry's strategy to enhance and consolidate environment awareness and security, in addition to sustaining the best levels for developing natural resources.

URUGUAY

Uruguayans used around 1,400 million plastic bags per year in 2008, a total consumption of plastic bags averaging 432 bags per person per year. There is no national legislation now in place to restrict the circulation of plastic bags in Uruguay, according to industry body Cempre (2011).[196] However, the Uruguayan National Environmental Bureau (Dirección Nacional De Medio Ambiente) has issued a Strategic Action Plan for Sustainable Management of Plastic Bags (2009).[197]

There is a national action plan; it does not seek to remove or ban plastic bags, but to reduce their indiscriminate use, promote reuse and improve their final disposal to minimise environmental impacts. This plan will run from 2009 to 2015 and has been designed to serve as a tool for planning and for facilitating actions between the public and private sector. Within the plan, there are five strategic lines of action to be developed in an integrated manner, each with relevant targets:

Strategy 1: Reduction of plastic bag consumption per capita

- Target 2015: 40% reduction of average consumption per capita bags compared to 2008.

Strategy 2: Promotion of reuse and recycling of plastic bags

- Goals for 2015: 100% increase in the volume of plastic bag recycling in relation to 2008
- Major outlets to adopt quality criteria.

Strategy 3: Replacing traditional materials with others more easily degradable

- Goal for 2011: 80% of plastic bags sold by major outlets is oxo-biodegradables/biodegradable
- Goal for 2015: 100% of plastic bags sold by major outlets is oxo-biodegradables/biodegradable
- 50% of all bags are of oxo-biodegradables or biodegradable materials.

Strategy 4: Improve management of urban solid waste

- Goals for 2015: Increase of 50% of investments in public via containers compared to 2008.
- 50% of the departmental capitals to receive a substantial improvement in street cleaning
- 100% of the departmental capitals to have management plans in place for packaging.

Strategy 5: Promotion of cultural change towards a responsible and rational use of plastic bags

- Target 2015: 75% of the population to take some action to reduce plastic bag wastage.

USA

There is no national legislation on plastic bags in America. However, retail bag regulations have been enacted or proposed at either the state or local level in around 30 states.

An excellent source of information which reviews the situation in America has been put together by the State of Florida's Department of Environmental Protection (DEP). The state's *Energy, Climate Change, and Economic Security Act of 2008 (House Bill 7135)* required the DEP to perform an analysis and submit a report (Florida DEP, 2010)[198] to the Legislature by February 1, 2010 regarding the necessity and efficacy of both state-wide and local regulation of bags used by consumers to carry products from retail establishments.

Table 8. Options for discouraging and reducing the use of thin-walled retail bags (Source: Florida DEP, 2010)

Option	Pros	Cons	Additional Comments
Educational campaign	Easy to implement	Limited impact unless coupled with other option(s)	-
Encourage In-Store Recycling	Uses infrastructure that exists already Increases recycling Produces moderate quality feedstock Material is in demand	May be costly to stores Does not accommodate compostable/biodegradable alternatives Low to moderate participation in existing programmes	-
Retail Stores offer Reusable Bag Credit	Allows retailers to be proactive & flexible Attractive to customers Incentive aimed at changing behaviour – reducing consumption	Not attractive to all retailers Credit is usually small (1 to 5 cents) and is therefore undervalued by consumers	Pilot study of a reusable bag policy at 100 stores found 58% reduction in the number of plastic bags used
Require biodegradable bags as an option at checkout	Bags are easy for stores to purchase Customers feel 'greener'	Bags are expensive, cost will be passed on to customers Confuses consumers who don't realize that bags will not biodegrade in home composters Can contaminate plastic recycling	-
Require additional recycled content in bags	Easy to accomplish for paper bags Reduces some environmental concerns from manufacturing	More difficult for plastic bags Increased recycled content bags are more expensive Does not address end-of-life concerns Minimally addresses manufacturers' environmental concerns	Current average recycled content both for paper bags and for plastic bags is 30%
Implement pilots in interested communities	Some communities in Florida have expressed interest	Difficult for retail chains to implement something in just a small area	-
Set recycling rate goal (number recycled/year)	Increases recycling Material is in demand	Hard to track Does not reduce the number of bags used Does not address manufacturers' environmental concerns	-
Require bag consumption reduction (+ plan to enact ban or fees if not reached)	Reduces bag consumption Gives retailers flexibility	Hard to establish a baseline Very difficult for smaller stores to track	-
Deposit System	Customer gets amount of deposit back when bags are turned in for recycling Increases recycling	Requires stores to take bags back for recycling Doesn't reduce the number of bags used	No successful examples
Increasing fee over time	Incentive to reduce consumption Could fund recycling and educational campaigns Reduces litter Reduces costs of clogged drains	Fees may be perceived as a tax May transfer business to surrounding locations Potential job losses	-
Flat fee (no increase over time)	Reduces consumption Reduces litter Reduces costs of clogged drains	Consumers get used to paying and consumption creeps up Fees may be perceived as a tax May transfer business to surrounding locations Potential job losses in plastic bag manufacturing and recycling	-
Ban	Reduces consumption Reduces environmental damages Reduces litter Reduced costs of clogged drains	Some consumers like convenience of store-provided bags May promote shift to disposable alternatives Potential job losses	-

Florida DEP sought to enquire whether a regulation on retail bags was necessary. To determine this, the authors examined data on:

- the number of retail bags generated, recycled, and disposed
- the role retail bags play in Florida's litter
- the effect retail bags have on wildlife and environment
- life cycle studies which compare various retail bag alternatives
- retail sector response to environmental issues connected with the use of bags

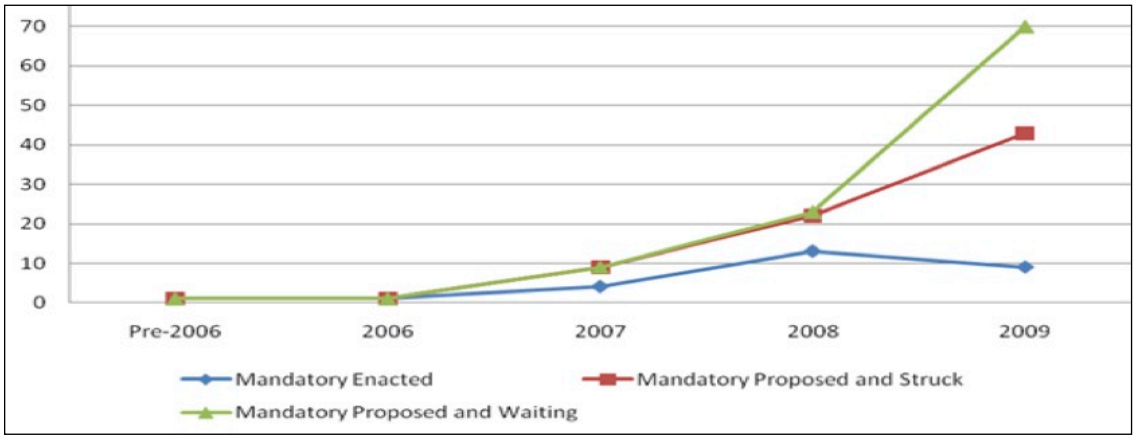
The authors of this review noted that almost every retail establishment has a bag for its customers and Americans used almost 90 billion of them in 2003. Retail bags are most commonly paper and plastic thin-walled bags. Only a relatively small percentage are reused or recycled (12% of plastic bags and 37% of paper bags) while far too many damage the environment because people improperly handle and dispose of them.

Improper handling and disposal of retail bags has been shown to harm the environment. While plastic bags may appear to be the major problem, the solution is not to switch to paper. Life cycle analyses show a higher level of environmental harm from manufacturing to disposal of paper compared to plastic bags. A switch to biodegradable or compostable bags is not the answer either. Since Florida has no solid waste commercial scale composting facility to handle these bags, they would end up in a landfill just like paper or plastic bags.

While all strategies to reduce the use of retail bags have merit, some are more effective than others. Although they initially pose an inconvenience for some consumers, bans produce the fastest results, closely followed by user fees and taxes. Voluntary efforts are more readily accepted by the retail industry and the public, but take more time to produce results. While voluntary efforts can be helpful in changing behaviour patterns, their effectiveness is dependent on the number of retail establishments participating. Public education is crucial to any approach, to illuminate the damages caused by thin-walled bags, and the cost to undo the harm, and promote reusable bags. Collaboration with the retail sector is also essential.

Figure 9 shows that the number of mandatory policies for bag reduction has increased steadily since 2006.

Figure 9. Number of mandatory retail bag policies proposed and enacted in America



BIODEGRADABLE BAGS IN AMERICA

Biodegradable and compostable bags are gaining attention as alternatives to plastic and paper bags. The technology has improved since first introduced and some manufacturers now market biodegradable bags with a 'lifespan'. There are multiple types of biodegradable and compostable bags. Compostable bags should meet ASTM D6400-04, the standards for plastics designed to be composted in municipal and industrial aerobic composting facilities.

Biodegradable bags now fall into the following categories:

- photo-degradable react to ultra-violet light to break down
- hydro-biodegradable react to —moist biologically active environments to break down
- oxo-biodegradable use additives to react with the atmosphere in order to break down.

While bags that do not persist in the environment sound like a positive step, there are serious drawbacks. All types of biodegradable and compostable bags must be placed under specific conditions to degrade properly. For instance, a photo-degradable bag will not break down if it is covered by water or otherwise obscured from light and an oxo-biodegradable bag requires direct access to oxygen and sunlight to degrade.

Any consumer who places a labelled 'biodegradable' bag in the home compost pile will not see the promised degradation because the required high temperatures achieved in municipal composting facilities cannot be achieved with home composting. Additionally, some of these bags leave plastic pieces or other residues when they break down, leftovers that natural systems and wildlife cannot tolerate. Finally, biodegradable bags inadvertently lead to litter because consumers assume the bags will quickly break down or compost, whatever the conditions; they discourage environmental stewardship.

FEDERAL INITIATIVES

In April 2009, the US Congress introduced the *Plastic Bag Reduction Act of 2009 (H.R. 2091)*[199] to amend the *Internal Revenue Code of 1986* to impose a retail tax on thin-walled carryout bags, and for other purposes. However, this bill never became law. This bill was proposed in a previous session of Congress. Sessions of Congress last two years, and at the end of each session all proposed bills and resolutions that haven't passed are cleared from the books.

The American Chemistry Council runs a comprehensive online facility to encourage the recycling of plastic bags (www.plasticbagrecycling.org), and is highly critical of such policy instruments as bans.

The ACC notes[200] that plastic grocery bags are an extremely resource-efficient products; plastic bags require 40-70 per cent less energy to manufacture than paper bags. For every seven trucks needed to deliver paper bags, only one truck is needed for the same number of plastic bags, helping to save energy and reduce emissions. It takes 91% less energy to recycle plastic than paper.

The recycling of plastic bags and film reached a record high across the United States in 2008, continuing a growing national recycling trend. An estimated 832,394,000 pounds (378,000 tonnes) of post-consumer film (including plastic bags and product wraps) were recovered in 2008, according to the latest *National Post-Consumer Recycled Plastic Bags and Film Report.*[201] This represents a 28 per cent increase in bag and film recycling since 2005. The boost in recycling was driven by greater consumer access to collection programmes, primarily at large grocery and retail stores, as well as by new markets for these recycled materials.

The recycling report was conducted by Moore Recycling Associates, Inc. of Sonoma, California, based on information obtained from 79 domestic processors, end-users of film material and exporters. The recycling numbers reported likely understate actual bag and film recycling because export data is more difficult to obtain than data on domestic recycling, and in 2008 there was a shift toward export markets, according to the report. Data collection also was affected by the rapid spike in the number of collection programmes as many stores launched new programmes to recover post-consumer plastic bags and product wraps from their customers. There are now retail store collection programmes in all 50 states.

The increasing number of bag and film recycling programmes are being led by plastic bag makers. Last year, the Progressive Bag Affiliates announced a recycling goal of 40 per cent recycled content in all plastic shopping bags made by these companies by 2015.

When fully implemented, the *Full Circle Recycling Initiative* (launched in 2009)[202] is expected to reduce greenhouse gas emissions by 463 million pounds (210,000 tonnes), conserve enough energy (mainly natural gas) to heat 200,000 homes, and reduce waste by 300 million pounds (136,000 tonnes) every year.

STATE AND LOCAL INITIATIVES

The first US state-level plastic-bag legislation was enacted in Washington, DC in 2009, although several cities and counties have had them in place since 2007.[203] Table 9 below shows the diversity and number of local level policy initiatives in America.

Table 9. Local Enacted Regulations in the United States (Source: Florida DEP, 2010)

Location	Population	Year effective	Ban	Fee	Recycling requirements	Voluntary	Provide Alternatives (1)
30 communities, AK	16,500	1998	✔				
Austin, TX	656,562	2007				✔	
Lake County, IL	712,453	2007			✔		
Oakland, CA**	404,155	2007	✔				
Phoenix, AZ	1,567,924	2007				✔	
San Francisco, CA	808,976	2007					✔
Suffolk County, NY	1,512,224	2007			✔		
Albany County, NY	298,130	2008			✔		
Chicago, IL	2,853,114	2008			✔		
Fairfax, CA	7,066	2008	✔				
Los Angeles, CA	3,833,995	2008				✔	
Malibu, CA	13,009	2008	✔				
Manhattan Beach, CA (2)	36,605	2008	✔				
Nassau County, NY	1,351,652	2008			✔		
New York City, NY	8,363,710	2008			✔		
Paia, HI	2,752	2008	✔				
Rockland County, NY	298,545	2008			✔		
Solana Beach, CA	12,825	2008				✔	
Tempe, AZ	175,523	2008				✔	
Westchester County, NY	953,943	2008			✔		
Edmonds, WA	40,158	2009	✔				
Madison, WI	231,916	2009			✔		
Marshall County, IA	39,523	2009					✔
Outer Banks, NC	33,518	2009	✔				
Palo Alto, CA	59,395	2009	✔				
Tucson, AZ	541,811	2009			✔		
Westport, CT	26,051	2009	✔				
Fairbanks, AK	35,132	2010		✔			
Washington, DC (3)	591,833	2010	✔	✔			
Kauai County, HI	63,689	2011	✔				
Maui County, HI	143,574	2011	✔				
Total			**13**	**2**	**10**	**5**	**2**

(1) Provide alternatives means to provide alternative bags such as compostable or reusable bags.
(2) Under lawsuit, not in effect.
(3) Washington DC has both a ban and a fee.

RECYCLING LAW IN DELAWARE STATE

In 2009, the US state of Delaware passed legislation (*HB15 - Act to amend Chapter 60, Title 7 of the Delaware Code relating to recycling and waste reduction in The State Of Delaware*)[204] requiring increased consumer access to plastic bag recycling. The new law, similar to those already passed in the states of California and New York, required retailers and chain stores that issue plastic bags to consumers to provide collection bins for their recycling. The legislation will also require retailers to provide consumers with an option to purchase reusable bags and will require plastic bag manufacturers to print a recycling message on all shopping bags.

PROPOSED BAN IN OREGON

Proponents of mandatory bans were hoping in April 2011 that Oregon would become the first American state to adopt such an instrument. *Senate Bill 536*[205] would prohibits use of thin-walled checkout bags except in certain cases. Steps taken by April 2011 included:

- January 10, 2011: Introduction and first reading
- January 14, 2011: Referred to Environment and Natural Resources
- February 8, 2011: Public Hearing held
- March 3, 2011: Work Session held
- April 21, 2011: Work Session held
- May 2, 2011: Recommendation: Do Pass with amendments
- May 2, 2011: Referred to Rules by order of the President
- June 1, 2011: Public Hearing held.

The text of the *Oregonian Senate Bill 536*[206] would introduce a range of measures including:

- prohibiting use of thin-walled checkout bags except in certain cases
- allowing Department of Environmental Quality to impose civil penalty
- prohibiting local governments from imposing charges on checkout bags or other bags provided to customers
- repealing the statute requiring retail establishments that offer plastic bags to customers to also offer paper bags.

Senate Bill 536 became mired in Senate Rules[207] since May 2, 2011 after plastic bag manufacturer Hilex Poly launched a lobbying effort against the legislation. The revised amendments would outlaw plastic bags unless recycling benchmarks of 20 per cent are met each year. It would also preclude cities and counties from passing separate legislation.

SAN FRANCISCO PLASTIC BAG BAN

In 2005, San Francisco Environment (SFE)[208] estimated that more than 180 million plastic bags were distributed in San Francisco. With no significant reduction in the number of bags nor any increase in plastic bag recycling, the City targeted the largest retail distributors of plastic check-out bags. In an effort to reduce plastic bag use, the City partnered social marketing campaigns such as *Bring Your Own Bag* and distributed thousands of SFE-branded canvas bags made from scrap cloth.

From December 2007, large Supermarkets (over US$2 million in gross annual sales receipts) and chain pharmacies were prohibited from distributing plastic checkout bags. Instead they may distribute BPI certified compostable bags, paper bags made with a minimum 40% post-consumer recycled content, or reusable bags. The intent of this legislation was to reduce the amount of thin-walled plastic bags used and disposed of in the City. SFE considered that while research indicates that a fee on check-out bags is the best way to achieve this goal, state laws currently prohibit cities from assessing bag fees. The *San Francisco Plastic Bag Reduction Ordinance*[209] is an action that taken until better state-wide legislation is enacted.

By mid-2010 it was reported that since the San Francisco ban was implemented, with an estimated 100 million plastic bags per year removed from the waste stream.[210]

CALIFORNIA STATEWIDE PLASTIC BAG BAN REJECTED BY LAWMAKERS

On August 31, 2010, California lawmakers rejected a bill seeking to ban plastic shopping bags after a contentious debate over whether the state was going too far in trying to regulate personal choice.[211] The Democratic bill would have been the first state-wide ban, although a few California cities already prohibit their use.

Supporters of the bill said the 19 billion plastic bags state residents use every year harm the environment and cost the state $25 million annually to collect and manage. It had been the subject of intense lobbying by industry, which called it a job killer. The bill, *AB1998,*[212] called for the ban to take effect in supermarkets and large retail stores in 2012. It would have applied to smaller stores in 2013.

Republicans and some Democrats opposed it, saying it would add an extra burden on consumers and businesses at a time when many already are struggling financially.

GREEN CITIES CALIFORNIA ENVIRONMENTAL ASSESSMENT OF GROCERY BAGS

In 2010 Green Cities California published a *Master Environmental Assessment* (MEA)[213] on the subject of thin-walled, or disposable, grocery shopping bags, to help cities and counties determine the significance of actions that they may take to cut back on the use of thin-walled grocery bags. *Green Cities California* (GCC)[214] is a coalition of thirteen local governments which aims to accelerate the adoption of sustainability policies and programmes through collaborative action.

Findings of the study were as follows:

- **Thin-walled plastic bags:** Nearly 20 billion thin-walled high density polyethylene (HDPE) plastic grocery bags are used annually in California, and most end up in landfills or as litter. In fact, of the four types of bags considered, plastic bags had the greatest impact on litter.
- **Thin-walled paper bags**: Kraft paper bags are recycled at a significantly higher rate than thin-walled plastic bags. Still, over its lifetime, a thin-walled paper bag has significantly larger greenhouse gas (GHG) emissions and results in greater atmospheric acidification, water consumption, and ozone production than plastic bags.
- **Thin-walled biodegradable bags:** Although biodegradable bags are thought to be an eco-friendly alternative to HDPE plastic bags, they have greater environmental impacts at manufacture, resulting in more GHG emissions and water consumption than conventional plastic bags. In addition, biodegradable bags may degrade only under composting conditions. Therefore, when littered, they will have a similar impact on aesthetics and marine life as HDPE plastic bags.
- **Reusable bags:** Reusable bags can be made from plastic or cloth and are designed to be used up to hundreds of times. Assuming the bags are reused at least a few times, reusable bags have significantly lower environmental impacts, on a per use basis, than thin-walled bags. Some of the reviewed LCAs indicate that use of the non-woven plastic reusable bag results in particularly large environmental benefits.
- **Effects of policy options on thin-walled bags**: In other regions of the world, fees and bans on bags have resulted in dramatic drops in consumption. For instance, the Irish plastic bag tax immediately resulted in a greater than 90% reduction in use. Due to California law AB2449, no fee program on plastic bags can be introduced. However, bans on thin-walled plastic bags, as well as fees on other thin-walled bags, may be implemented to minimize use.
- City of Chicago plastic bag recycling ordinance

In 2009, the City of Chicago[215] introduced a *plastic bag recycling ordinance*[216] requiring businesses that provide plastic bags to customers to:

- **Print or display** on every plastic carryout bag:
  - '*Please Reuse Or Recycle At Participating Store*' using letters at least ½ inch in height; or
  - a similar message encouraging the reuse or recycling of plastic carryout bags that is no less than 1 inch in height and uses letters at least ¼ inch in height

- **Provide a bin** for the collection of plastic bags and other film plastic that is visible and easily accessible to customers
- **Make reusable bags available** at or near where plastic bags are dispensed. Reusable means:
  - a bag made of cloth or other machine washable fabric with handles, **OR**
  - a durable plastic bag with handles that is at least 1.15 mils thick and specifically designed and manufactured for multiple reuse
- **Recycle or reuse** any plastic bags collected
- **Submit an annual report** to the Department of Environment each year providing the weight, location and cost for recycling the plastic bags.

There is no exemption based on size of establishment and no exemption for the quantity of bags handed out. The ordinance does not apply to fast food restaurants or other types of food service establishments.

AMERICAN SAMOA

American Samoa, an unincorporated territory of the United States located in the South Pacific Ocean, southeast of the sovereign state of Samoa (formerly known as Western Samoa), approved an *Act prohibiting supplying of plastic bags to consumers (HB No. 31-4, Public Law 31)*[217] on January 11, 2010.

The American Samoa Environmental Protection Agency[218] along with the Departments of Commerce and Public Safety were designated and authorised to enforce the provisions of this law on its effective date.

The plastic shopping bag ban became effective on February 23, 2011, after which date supplying petroleum-based plastic shopping bags to consumers and customers is prohibited.

VIETNAM

Vietnam's President Nguyen Minh Triet promulgated Vietnam's first Environmental Tax Law in November 2010.[219] The Environmental Tax became effective on January 1, 2011 and makes products made from oil and gas, coal and the hydro-chloro-fluoro-carbons, HCFCs, used in refrigeration liable for tax. These include plastic bags, pesticides, agricultural-produce preservatives, warehouse sanitisers and chemicals to kill termites. The tax is necessary to help protect the environment, explained Deputy Finance Minister Do Hoang Anh Tuan.

Vietnam will impose an environmental tax of VND45,000 (EUR1.5) per kilo on nylon bags, according to a draft resolution by the National Assembly Standing Committee. Different tax rates for environmental protection in the draft resolution are expected to take effect as of January 1, 2012.[220] The environmental-tax law was approved by the National Assembly on November 15, 2010

CONCLUSIONS

Plastic bags are ubiquitous. They are lightweight, cheap, durable and provide excellent functionality in the main purpose, the carrying of purchases between shops and homes. They can carry colourful images and brand identities and serve as useful forms of advertising, which customers have for half a century been happy to use.

It is clear that there are a number of options open to policy-makers to help towards improving the environment and avoid the littering problem; these options are diverse, not particularly clear-cut and depend on a web of inter-connected factors. Whether the preference is to opt for a ban, a tax or voluntary initiatives, one cannot simply replicate a single approach in countries with different cultures, prosperity, consumer attitudes, as well as the availability of the right infrastructure or the possibility to set up the required infrastructure are only some of the aspects to be carefully considered.

It is also clear, that for any real significant and lasting change in behaviours towards the use of plastic bags, continuous awareness-raising campaigns will be crucial.

Arguments supporting further use reduction

- to change attitudes towards resource use, moving from a 'throwaway' society to more sustainable lifestyles
- alternatives are readily available
- possible environmental benefits of long-life bags (including plastic bags) compared to thin-walled bags
- to reduce littering and associated social impacts
- to reduce other impacts, such as possible effects on infrastructure (e.g. blocked drains), or ingestion by wildlife
- to respond to public pressure for action against plastic bags
- to improve waste management by focusing on prevention and re-use, rather than options further down the waste hierarchy (including recycling).

Arguments against further use reduction

- thin plastic bags have a better lifecycle environmental performance than alternatives
- some alternatives are less hygienic and not waterproof
- thin-walled bags can be (and are) re-used
- thin-walled bags are fully recyclable
- plastic bags are made from a by-product of oil refining and use resources that could otherwise be thrown away
- actions taken to reduce plastic bag use can have negative environmental consequences
- plastic bags have a high calorific value, which can be captured in energy recovery plants
- shoplifting may be easier when many people carry their own reusable bags.

In brief, the application of the major policy instruments – bans and taxes/charges - in the countries reviewed is shown in tables 10 and 11 below.

It is clear that the range of taxes and charges applied is very large; from trivial to highly significant levels.

Table 10. Summary of key instruments applied to some plastic carrier bags in Europe (EU27+4).

COUNTRY	BANS	TAXES	VOLUNTAY	Additional information
EUROPEAN UNION				
AUSTRIA			✔	No ban, but looking at ways to reduce use. Pilot project currently in place in large supermarkets replacing traditional thin bags for fruit and vegetables by biodegradable ones
BELGIUM		✔	✔	Green tax of 3 EUR/kg Wallonia intended to ban single use bags Voluntary agreement of retail sector not to hand out thin bags free of charge, some of which now only have thick bags
BULGARIA		✔ (07/2011)		Starting from 0.077 EUR/pc in 2011 to increase to 0.28 EUR/pc in 2014
CYPRUS				Proposals to ban were rejected
CZECH REPUBLIC				150-300/y each (3 bn/y) – nothing in the pipeline
DENMARK		✔		Eco-tax of 3 EUR/kg
ESTONIA		✔ (expected)		Legislative proposals on the table calling for a tax increase by 0.19cent (euro) bringing the total cost to approximately 0.32cent (euro) per bag
FINLAND				400-500 million/y
FRANCE		✔ (2014)		1,500 million/y
GERMANY				Consider bags = packaging and fall under the DSD system
GREECE				
HUNGARY		✔(2011)		Reported, unconfirmed
IRELAND		✔		0.15 cents/bag passed on to the consumer
ITALY	✔			Ban on non-biodegradable bags as from Jan 2011
LATVIA		✔		
LUXEMBOURG			✔	Around 750 t/y. Series of agreements with Valorlux to reduce the quantity of thin plastic bags and promote reusable bags
MALTA		✔		Since March 2009 fee to be paid on all plastic bags even biodegradable ones
NETHERLANDS			✔	Although no longer part of the Packaging Covenant, retailers still don't give away bags free of charge
POLAND				Eco-tax law drafted but abandoned in Jan 2010
PORTUGAL				Proposal for a 90% reduction by 2017 target with intermediate targets of 30% and 60%
ROMANIA		✔		Since 2009 approx 0.05/€ for each bag made from materials other than biodegradables
SLOVAKIA				No eco-tax but producers and importers have to pay the fee of 0.17 €/kg to the Recycling Fund unless they recycle the plastic material
SLOVENIA		✔ (draft)		Proposes different for bags depending on material
SPAIN		✔ (in some regions)		Spanish waste plan includes provisions for replacing non-biodegradable plastic bags. Catalonia supports many reduction campaigns + 2 agreements on bags were reached. Andalucia + Cantabria have a tax on plastic bags (since 1/1/11)
SWEDEN				Climate Change Acts allow reduction campaign and charges.
UK		✔	✔	WRAP has brokered voluntary reduction plans Wales has introduced charges from 10/2011.
NON-EU EUROPE				
CROATIA				Proposal for a tax is being discussed
ICELAND		✔		Levy used for environmental projects.
NORWAY				A ban was considered, but not implemented. A tax was applied, then dropped.
SWITZERLAND				Proposal to ban on non-biodegradable bags

Table 11. Summary of key instruments applied to some plastic carrier bags in Rest of World.

COUNTRY	BANS	TAXES	VOLUNTAY	ADDITIONAL INFORMATION
REST OF THE WORLD				
ARGENTINA	✔ (partial)			Draft national law to prohibit plastic bags, likely to result in gradual introduction of biodegradable bags. Mendoza province banned bags in 2004.
AUSTRALIA	✔ (most)		✔	3.9 billion/y (2007). Several states have introduced bans and gradual phasing-out is in place
BANGLADESH	✔			14 billion/y (before ban).
BERMUDA				Proposal for a ban
BOTSWANA	✔ (thin)	✔		
BRAZIL			✔	Sao Paulo state and supermarkets voluntary accord (2008)
CANADA				2.86 billion/y. No national initiatives although local initiatives include bans, phase-outs and education measures.
CHILE				Draft law to ban bags was introduced.
CHINA	✔	✔		China introduced ban in 2008 (25 microns). Hong Kong has a levy.
GHANA				
INDIA	✔ (many)			Many states have introduced bans (40, 50 or 70 microns). Himachal Pradesh offers by-back of plastic bags.
ISRAEL				2 billion/y.
JAPAN			✔	Nagoya City targeted 60% reduction.
JORDAN				Policy to reduce bag use is under consideration, probably via a charge.
KENYA	✔			Government introducing legislation to ban bags (below 30 microns gauge). In 2011 steps launched to ban plastic bags <60 microns.
MACEDONIA	✔ (2011)			Switch to biodegradable bags planned by 2013.
MEXICO	✔			288 bags/y in Mexico City. Banned non-biodegradable free plastic bags.
MALAYSIA				One state (Selangor) applies a charge on bags
NEW ZEALAND			✔	244 million/y. NZ Packaging Accord with industry.
PHILIPPINES				Government preference for recycling initiatives rather than bans/charges. In 2011, Muntinlupa City introduced a ban.
RWANDA	✔			
SOMALILAND	✔			Ban introduced in 2005.
SOUTH AFRICA	✔ (thin)	✔		Ban introduced in 2003.
SYRIA				Government campaigning to reduce bag use. A tax/charge is said to be likely to follow.
TOGO	✔ (2011)			
UGANDA	✔			
UAE				Government ban on printing on non-biodegradable bags (2010).
URUGUAY				1,400 million/y. Strategic Action Plan for Sustainable Management of Plastic Bags in place: targets set for reducing use (-40% by 2015) and for recycling (100% increase by 2015) - both compared to 2008.
USA				2009 Bill in Congress to tax bags was never approved. Bans, fees and recycling requirements are widespread at the local level.

The choices facing policy-makers are diverse, not particularly clear-cut and depend on a web of inter-connected factors. As is the case for most policy decisions, national, regional and local administrations can act at different levels. In democratic systems decisions are usually reached after assimilating views of relevant stakeholders.

For plastic bags, policy decisions range from doing nothing beyond token gestures (for example a supermarket offering eco-points to customers bringing their own bags) to the extreme and comprehensive measure which is the legislated prohibition. Between these poles, one can find an array of measures which can yield varying results.

Whether the preference is to opt for a ban, a tax or voluntary initiatives, one cannot simply copy-past that which is being done in one country in the other, and culture, per capita GDP, consumer acceptance, as well as the availability of the right infrastructure or the possibility to set up the required infrastructure are only some of the aspects to be carefully considered.

Bans are often applied to non-biodegradable lightweight, thin plastic bags, with some administrations being more fussy than others about the nature of the biodegradability (for example extending bans to bags which are less than fully compliant with authorised national compostability standards).

Bans usually specify a minimum gauge or thickness, ensuring that heavier, more durable (and therefore more prone to being reused) bags are permitted. Prohibitive legislation is more likely to be applied in poorer countries (typically with an annual per capita GDP of US$10,000 or less), where plastic bags can really jeopardise public health or commerce.

Taxes and charges are sometimes accompanied by a threat of a ban in the event that particular targets for bag use reduction are not met. These charges may be applied in tandem with voluntary agreements by industry to reduce bag consumption. Sometimes, effective voluntary action by retailers can forestall the need for mandatory legislative interventions.

Of course, making customers pay for their plastic bags can serve both to elicit a behavioural change, and to generate funds with the option (although this ought to be systematic) to allocate these to environmental causes, and more specifically, to projects focusing on improving the environmental performance of these bags over their life cycle, e.g. projects aiming at setting up collection schemes or improving recycling facilities.

However, although taxes have had a positive impact on the consumption of plastic carrier bags in most of the countries where they have been applied, one has to keep in mind that taxes could have a perverse effect; an example being that of Ireland, where, although the tax lead to a huge decrease overnight in the use of plastic bags, the sales of bin liners increased dramatically.

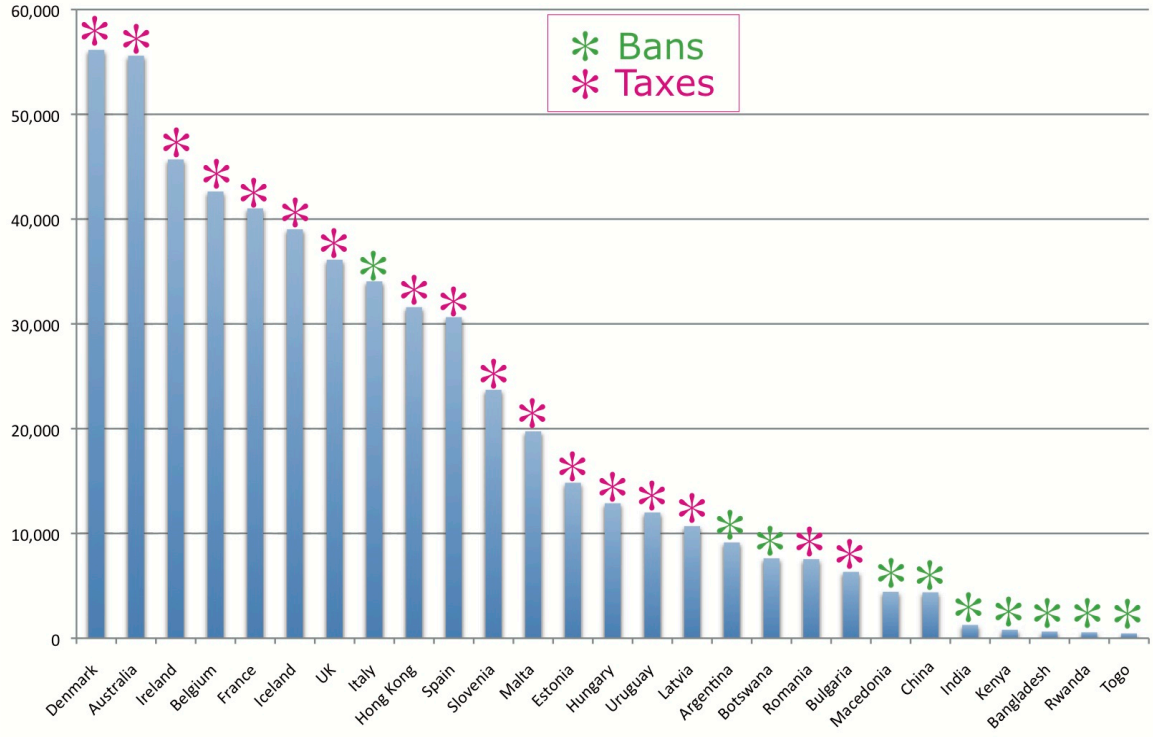
Regardless of whether measures to limit dependency on lightweight thin plastic bags are implemented by ‘top-down’ policies, or by ‘bottom-up’ grassroots initiatives, there is a connection between these symbolic behavioural changes and other more important issues connected with resource use, environmental impacts and sustainable consumption and production.

Furthermore, when looking at the policy options chosen by each individual country around the world, it is interesting to note the possible relationship between a nation’s affluence and its choice of policy instruments. It is clear that banning plastic bags outright is a more viable option for developing countries to solve the litter problem and to avoid any true environmental impact caused by discarded plastic bags, mainly due to the fact that these countries lack the resources to invest sufficiently in public sector infrastructure and any educational and awareness-raising campaign which would need to accompany any other choice of measure.

It is worth considering the possible relationship between a nation’s affluence and its interest in applying different policy instruments when controlling plastic bags. Figure 10 below shows that Italy (with its 2011 bag ban) is the anomalous country amongst wealthier nations.

In wealthier countries, where plastic bags are addressed in national policy terms it is because they pose a littering problem or because they are taken to symbolise the undesirable face of rampant consumerism – tokens for their contents. In these more prosperous nations, actions against plastic bags are more widespread at a local level. Community actions can crystallise around local anti-bag campaigns, entraining issues such as buying locally, food miles, community spirit, neighbourhood amenity and green political aspirations.

Figure 10. Per capita annual GDP (US$/y) and proclivity for bans or taxes to reduce usage of plastic bags



Although they initially pose an inconvenience for consumers, bans produce the fastest results, closely followed by user fees and taxes.

Banning thin-walled plastic bags can be a solution on countries with poor waste management and sewerage infrastructure, though there are enforcement costs and employment implications. Clearly, those countries which lack the resources to invest sufficiently in public sector infrastructure are likely to face the most significant threats (not simply to the environment) from thin-walled plastic bags. It is these countries (with the notable European exception of Italy) that have enacted blanket bans.

Charging for bags can deliver rapid changes in behaviour, though there is evidence that consumer sensitivity to the charge declines over time.

Voluntary efforts are more readily accepted by the retail industry and the public, but take more time to produce results. While voluntary efforts help change behaviour patterns, their effectiveness is dependent on the number of retail establishments participating. Encouraging shoppers to return bags for recycling is popular with retailers and the public. In the best schemes, initiatives are also adopted to build markets for the recyclate that this generates.

Whenever the issue of plastic bags is considered, consumer behaviour and governmental policies will be pivotal in encouraging people to use fewer bags and in promoting more recovery systems in order to improve overall resource efficiency.

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