

# **A Plastic Bag Free Britain: Is this achievable or actually even desirable?**

## **Introduction**

The single use plastic bag, the *bête noire* of environmentalists, has recently become an almost daily topic in the mainstream media. This follows the introduction of a plastic bag tax in Ireland in 2002, the failed legislation to tax their use in Scotland in 2005 and more recent voluntary agreements with major retailers in the UK to reduce plastic bag consumption. As the UK government is reluctant to tax plastic bag consumption (DEFRA 2006), towns across the UK are attempting to go 'Plastic Bag Free' themselves. Modbury in Devon was the first to achieve this status in May 2007 (Hosking 2007).

Critics say that plastic bags are the ultimate symbol of our throwaway society and are a blot on the landscape; littering both the countryside and coastlines. Proponents call them "a hygienic, odourless, waterproof, robust and convenient way of carrying goods" (British Plastics Federation 2002). They also say that the alternatives are much worse environmentally.

As discussed during the A1 module, global problems such as peak-oil, climate change and environmental pollution will affect us all. Plastic bags use oil, a non-renewable resource and are used in their millions daily, contributing to these problems. I am going to investigate their production and consumption and compare the alternatives. I will assess if eliminating their use completely is achievable or even desirable.

## **The ubiquitous carrier bag**

Plastic bags come in many shapes and sizes but for the purpose of this essay I have used the following definition:

"Standard, single use, lightweight HDPE plastic bag designed for the general purpose carriage of goods by consumers, excluding light plastic bags for the packing or perishable food and vegetables" (Eurocommerce 2004, p. 30)

This is similar to definitions used by other authorities in documents concerning carrier bag levies and taxes (Scottish Government 2005).

DEFRA estimates that 13 billion bags are used yearly in the UK (DEFRA 2006), mainly given away free by retailers (Which? 2007). Consumers are accustomed to receiving them; a habit which may be very hard to break. Retailers may be unwilling to upset their customers by charging for bags as well as being accustomed to their customers carrying around free advertising for their business.

The UK carrier bag lobby group promotes plastic bags as being good for public health as they protect food from external contaminants as well as being light, transportable and reusable in a multitude of ways (British Plastics Federation 2002). Opposition to the levy in Scotland raised emotive issues such as road pollution (paper bags would mean 7 times the number of HGVs on the road) and the loss of 1,000 Scottish jobs in the industry (Carrier Bag Consortium 2004b).

They may have a point. Despite being a proportionally small part of both litter and landfill streams and consuming little oil, plastic bags appear to have become a sort of green “scapegoat” for the other ills of society. As Meadows (1999) said “never mind paper or plastic bags, how did you get to the grocery store?” Perhaps there are other more pressing issues to tackle first.

To put things in perspective, the average British person uses 134 bags a year corresponding to only 2 kilos of CO<sub>2</sub> or 1/50000 of a “yearly carbon allowance” (Marshall 2007). Not that climate change is the reason why people want to get rid of plastic bags; it is just one of many factors.

### **Plastic, plastic everywhere**

It was increasing concerns over littering and the potential economic repercussions for the tourism industry that forced the Irish government to introduce a plastic bag levy in 2002.

Plastic bags account for less than 1% of litter recorded in the UK and during recent beach surveys only around 2% of litter on beaches was plastic bags (DEFRA 2006). Despite these low percentages, plastic bags are more of a visual blight than cigarette ends or drinks cans even though these are found in greater proportions in the litter stream. Their lightweight properties and large surface area mean they blow around until caught or snared on something such as a tree or bush.

The problem of littering is perhaps something that needs to be addressed through education and perhaps “on the spot” fines rather than banning or taxing a single product.

### **Unseen problems**

Plastic bags that end up in rivers or the sea, no longer able to blow away, eventually wash up into the oceans. 80% of marine litter comes from the land, an estimated 6.4 million tonnes a year of plastic (Greenpeace 2006) and the situation is continually getting worse (UNEP/Regional Seas 2005). David Barnes of the British Antarctic Survey has said that plastic bags have gone “from being rare in the late 80s and early 90s to being almost everywhere from Spitsbergen 78° North [latitude] to Falklands 51° South [latitude]” (Moore 2003). This is an enormous change in only a few decades.

Plastic bags can be mistaken for food by many marine animals especially those that consume jellyfish or squid (Marine Conservation Society 2005). Amongst some of the more horrifying statistics, 50-80% of sea turtles found dead had ingested plastic debris and 111 out of 312 species of seabird have been affected by the ingestion of plastic (Greenpeace 2006). 200,000 albatross chicks die each year; those dying from dehydration or starvation had twice as much plastic in their stomachs as those that died from other causes (Weiss 2006).

Rarely reported, the North Pacific subtropical gyre or “Great Pacific Garbage Patch” is a high-pressure system in the Pacific which due to swirling sea and air currents

catches debris, more and more of which is plastic. It is now estimated to be between 2-4 times the area of Great Britain. (Moore 2003) Huge amounts of plastic debris have been found, averaging 335,271 pieces per square kilometre as well as 6 kilograms of plastic for every kilogram of plankton (Moore et al. 2001).

No real studies have yet been carried out to investigate the effects of microscopic plastic being eaten by filter feeders at the bottom of the food chain (Moore 2003). But could what is occurring thousands of miles away eventually affect the global ecosystem and work its way up the food chain to us? There seems to be a moral imperative to reduce or stop using a particular material if we don't really know the long term consequences of its use.

### **What to do with them**

Although WRAP (DEFRA 2006) estimates that 80% of consumers re-use their plastic bags, that actually means that consumers re-use *some* of their bags *some* of the time. Secondary uses include bin lining and collecting dog litter. So despite the industry hailing reuse as a great benefit of carrier bags, they are only likely to be used once more before being dumped in landfill. How long it will take for these bags to degrade is unknown despite the commonly quoted statistic that "it will take between 500 and 1000 years". This is because standard respirometry tests do not work with polyethylene (Lapidos 2007). Plastic bags will eventually photodegrade down to microscopic pieces of polymer but even a single plastic molecule cannot be biodegraded naturally. (Casey 2007)

The recycling of plastic bags has always been insignificant due to high levels of contamination, a low volume to weight ratio and different types of plastic (Reusablebags 2007). Only 1-3% of bags are recycled and many are shipped to India or China where they can be incinerated under less stringent environmental laws. Furthermore, virgin plastic polymers still have to be added to produce recycled bags.

### **The Alternatives**

Plastic bags are a relatively small part of overall plastic consumption but they do seem to have a negative stigma attached to them. Maybe this is because they aren't really perceived as a product themselves, instead being a means of transporting other items. Their use has mushroomed in only half a century due to changes in shopping patterns and increasingly consumerist lifestyles. Is there any other type of material that could replace the billions of bags used each year without such an environmental footprint?

Instinctively paper bags seem like the perfect "renewable" solution. However life-cycle analysis shows that paper could be even worse than plastic (ILEA 2004).

Notwithstanding the number of trees felled, paper mills also produce toxic chemicals which contribute to both air and water pollution. The production process of paper bags generates 70% more air and 50 times more water pollutants than plastic bags. Paper also uses more energy during production (Washington Post 2007).

The UK government says it supports the development of plastic from non-fossil fuels (DEFRA 2006) but it appears that an environmentally acceptable bag may not yet

exist. There are several types currently available. Degradable bags still contain petroleum based plastic with a mineral additive; biodegradable bags break down with micro-organisms found in the environment (NNFCC 2007) and compostable bags may actually only compost in industrial composters and not in a home environment.

This variety of bags can lead to problems. If you put compostable or biodegradable material into landfill it will be digested anaerobically producing methane. There is no standardised labelling scheme to distinguish these bags which could be confusing to consumers (WRAP 2007). Furthermore, they may also give the consumer the idea that it is ok to consume and throw bags away.

Despite the assumed benefits, environmental organisations (Friends of the Earth 2005) are against these bags. Their full lifecycle produces as many emissions as plastic and they may also have contaminating effects if combined in a polyethylene recycling process (NNFCC 2007). Tesco currently gives away degradable bags which should not actually be placed into the recycling stream for the above reason (Channel 4 2007).

Some biopolymer based bags use potato starch. This means potatoes are actually being grown specifically for carrier bag production. This is a concern as it could have an effect on food supply in the same way that bio-diesel is potentially also diverting consumable food crops for fuel.

Alternative long life bags such as those made from cotton or hemp may have other damaging effects such as the use of pesticides and increased water consumption in areas where there is insufficient drinking water. There are companies such as 'ecobag' (Ecobag.com) who produce "sustainable bags made with organic cotton" but more investigation would be needed to show its "cradle to grave" environmental footprint.

It seems that no one product could currently replace the plastic bag without huge changes in infrastructure and education. One idea would be legislation that forces manufacturers to produce different coloured bags for different materials. This would at least offer consumers a chance of recycling or composting the product correctly.

### **A Taxing Solution**

With no perfect replacement bag, it seems sensible to firstly reduce the number of bags being produced and then encourage people to reuse bags. This seismic shift is something that may need to be led through legislation, as in Ireland, rather than expecting consumers to alter their own consumption patterns.

The Irish levy did initially reduce the numbers of plastic bags by over 90% from 328 to 21 bags per person per year (Lyons 2007). This gradually rose back to 30 per person before the tax was increased from 15c to 22c in July 2007. Both consumers and retailers in Ireland appear to be happy with the tax (Convery and McDonnell 2003).

Consumers in the UK also favour a tax with almost two thirds saying they would pay 10p for a carrier bag (MORI 2003). However, the UK Government (DEFRA 2006) has stated that there is:

“No evidence that such a tax would be beneficial on either broad environmental or litter grounds. This is because people would be encouraged to use bags made from other materials or alternative forms of packaging instead, which may be equally or more damaging to the environment.”

The British Plastics Federation is opposed saying the law would be anti-competitive and a serious restraint on trade (British Plastics Federation 2002). The Carrier bag Consortium comment that:

“Carrier bag taxes would bring no significant environmental improvement and could well cause more damage to our environment by encouraging more energy intensive, heavier, less durable alternatives which will not be reused.” (Carrier Bag Consortium 2004a)

## **Analysis**

As I mentioned in the introduction, towns such as Modbury have convinced the majority of retailers in their own town to not distribute petroleum based plastic bags (Hosking 2007). Although in principle this is a good idea, they are still distributing biodegradable bags which I have shown could actually be worse in the short term. Towns aiming to go plastic-bag free are also generally small, have strong community ties with local shops and are already “environmentally aware”. The impact of these small communities dotted around the country is minimal.

As the majority of bags used come from the major supermarket chains it is here where big changes need to take place. Despite recent reductions in bags given away and the introduction of modest charges by some supermarkets (Which? 2007) the overall rise in consumption continues.

Strong reusable bags seem to be the best solution. Whether these are made of cotton, hemp, stronger plastic or another material is something that would need to be examined in a life cycle analysis.

## **Conclusions**

Even though a plastic bag is produced from non-renewable resources, it could also be seen to be a less environmentally damaging option than other “single use” bags given the whole lifecycle. Therefore the only way to halt, reduce or wipe out the numbers of plastic bags in circulation is through a top-down government approach such as taxation. Small scale attempts to reduce plastic bag usage in small communities are not a long term solution.

Any taxation would also need to happen simultaneously with campaigns to make consumers reduce, reuse and recycle their bags. These campaigns could also be used to raise other larger environmental issues.

I actually don't think that plastic bags will ever disappear completely as they could be produced comparatively cheaply even if oil does become more expensive. It may be seen that a certain amount of strong reusable bags would be worth having.

Although it would be desirable to have a plastic bag free Britain due to the problems that plastic imposes on the environment, it is not something that is immediately achievable due to the way our society is setup. The growth of carrier bag use is ultimately linked to consumption and the capitalist system. This system requires consumers to keep spending; plastic bags are a cheap and easy way of carrying their purchases. Until something happens to change this we are unlikely to see a plastic bag free Britain any time soon.

### **Limitations and Further Work**

I had problems finding specific peer reviewed journals on plastic bags which has made the task more difficult. There is also a real lack of any life-cycle analysis from a solely UK perspective although Scottish and Irish documentation has been invaluable. Also figures showing how much energy is required to produce, recycle and dispose of different types of bags would have also been beneficial.

I think it can be quite shocking to discover that a non-renewable material could, in some circumstances, actually be better than something that you initially perceive as more “environmentally friendly”. This is something which I think could be investigated, especially seeing as a large proportion of bags given away in the non-grocery sector are made from paper. How would retailers in this domain cope if a tax was also introduced on all carrier bags, both paper and plastic?

## References

Ackerman, F, 1997. *Why do we recycle? Markets, Values and Public Policy*. Washington: Island Press

Bradshaw, B (23<sup>rd</sup> November 2006) *Speech to the WRAP Symposium on "Making the most of life cycle analysis"* [online]  
Available from: <http://www.defra.gov.uk/corporate/ministers/speeches/ben-bradshaw/bb0601123.htm> (Accessed 13th October 2007)

British Plastics Federation (2002) *Plastic Bag Tax – The Issues* [online] Available from: [http://www.bpf.co.uk/bpfissues/plastic\\_bag\\_tax.cfm](http://www.bpf.co.uk/bpfissues/plastic_bag_tax.cfm) (Accessed 13<sup>th</sup> October 2007)

Casey, S (20<sup>th</sup> February 2007) *Our oceans are turning into plastic...are we?* [online]  
Available from: [http://www.bestlifeonline.com/cms/publish/travel-leisure/Our\\_oceans\\_are\\_turning\\_into\\_plastic\\_are\\_we.shtml](http://www.bestlifeonline.com/cms/publish/travel-leisure/Our_oceans_are_turning_into_plastic_are_we.shtml) (Accessed 13<sup>th</sup> October 2007)

Carrier Bag Consortium (2004) *Scottish Bag Tax - Environmental Policy Review* [online]  
Available from:  
[http://www.carrierbagtax.com/downloads/environmental\\_review\\_ad.pdf](http://www.carrierbagtax.com/downloads/environmental_review_ad.pdf) (Accessed 14th October 2007)

Carrier Bag Consortium (2004) *UK Carrier Bag Consortium response to consultation document – An Environmental Levy Bill “Carrier Bag Tax For Scotland”* [online]  
Available from:  
[http://www.carrierbagtax.com/downloads/CBC\\_PRINGLE\\_RESPONSE.pdf](http://www.carrierbagtax.com/downloads/CBC_PRINGLE_RESPONSE.pdf)  
(Accessed 13th October 2007)

Channel 4 News (13<sup>th</sup> September 2007) *Factcheck: Tesco's degradable bags* [online]  
Available from:  
<http://www.channel4.com/news/articles/society/environment/factcheck+tescos+degradable+bags/798152> (Accessed 13th October 2007)

Convery, F and McDonnell, S, 2003. *Applying environmental product taxes and levies – Lessons from the Irish plastic bags levy*. Department of Environment Studies, University College Dublin, Dublin.

DEFRA (2006) *What happens to waste – Plastics and Plastic Bags* [online] Available from: <http://www.defra.gov.uk/ENVIRONMENT/WASTE/topics/plastics.htm> (Accessed 10th October 2007)

EPHC (2007) *Consultation Regulatory Impact Statement (RIS) Investigation of options to reduce the environmental impact of plastic bags* [online] Available from: [http://www.ephc.gov.au/pdf/Plastic\\_Bags/PlasticBags\\_Final\\_RIS.pdf](http://www.ephc.gov.au/pdf/Plastic_Bags/PlasticBags_Final_RIS.pdf) (Accessed 13th October 2007)

EuroCommerce (2004) *The use of LCAs on plastic bags in an IPP context*. [online] Available from: <http://eurocommerce.nettools.be/doc.aspx?doc=6/2145452578188346953366783393319956345071364004566f2949v1.pdf> (Accessed 1st October 2007)

Film and Bag Federation (2007) *History of the Plastic Bag* [online] Available from: <http://www.plasticsindustry.org/about/fbf/environment.htm> (Accessed 13th October 2007)

Friends of the Earth Scotland (August 2005) *Plastic Carrier Bag Levy* [online] Available from: [http://www.foe-scotland.org.uk/nation/PB\\_Carrier\\_bag\\_levy.pdf](http://www.foe-scotland.org.uk/nation/PB_Carrier_bag_levy.pdf) (Accessed 13th October 2007)

Greenpeace (2006) *Plastic Debris in the World's Oceans* [online] Available from: [http://oceans.greenpeace.org/raw/content/en/documents-reports/plastic\\_ocean\\_report.pdf](http://oceans.greenpeace.org/raw/content/en/documents-reports/plastic_ocean_report.pdf) (Accessed 11th October 2007)

Hosking, R (16<sup>th</sup> May 2007) *Carrying conviction* [online] Available from: <http://society.guardian.co.uk/societyguardian/story/0,,2079969,00.html> (Accessed 13<sup>th</sup> October 2007)

ILEA (2004) *Paper vs. Plastic Bags - Franklin Associates, Ltd., 1990* [online] Available from: <http://www.ilea.org/lcas/franklin1990.html> (Accessed 11th October 2007)

Imhoff, D, 2002. *Paper or Plastic – Searching for solutions to an overpackaged world*. San Francisco: Sierra Club Books

Lapidos, J (17<sup>th</sup> July 2007) *Will my plastic bag still be here in 2507?* [online] Available from: <http://www.slate.com/id/2169287/> (Accessed 12<sup>th</sup> October 2007)

Lyons, Rob (27th June 2007) *Who's afraid of... plastic bags* [online]. Available from: <http://www.spiked-online/index.php?/site/article/3612/> (Accessed 13<sup>th</sup> October 2007)

Marine Conservation Society (2005) *Environmental Levy on Plastic Bags (Scotland) Bill Memorandum by the Marine Conservation Society to the Environment and Rural Development Committee for the Scottish Parliament* [online] Available from: [http://www.adoptabeach.org.uk/pages/page.php?cust\\_id=51](http://www.adoptabeach.org.uk/pages/page.php?cust_id=51) (Accessed 13<sup>th</sup> October 2007)

Marshall, G (13<sup>th</sup> September 2007) *Can this really save the planet?* [online] Available from: <http://www.guardian.co.uk/environment/2007/sep/13/ethicaliving.climatechange> (Accessed 11th October 2007)

McDonough, W and Braungart, M, 2002. *Cradle to Cradle – Remaking the way we make things*. New York: North Point Press

Meadows, Donella (1999) *Never Mind Paper Vs. Plastic Bags, How Did You Get to the Grocery Store?* [online] Available from:



[http://www.sustainabilityinstitute.org/dhm\\_archive/index.php?display\\_article=vn800consumersguideed](http://www.sustainabilityinstitute.org/dhm_archive/index.php?display_article=vn800consumersguideed) (Accessed 13<sup>th</sup> October 2007)

Moore, C et al (2001) *A comparison of plastic and plankton in the North Pacific central gyre* [online]. *Marine Pollution Bulletin*, v.42, n.12 Dec 01. Available from: <http://www.mindfully.org/Plastic/Moore-North-Pacific-Central-Gyre.htm> (Accessed 13<sup>th</sup> October 2007)

Moore, C (2003) *Trashed – Across the Pacific Ocean, Plastics, Plastics Everywhere* [online] *Natural History* v.112 n.9 Nov 2003. Available from: <http://www.mindfully.org/Plastic/Ocean/Moore-Trashed-PacificNov03.htm> (Accessed 13<sup>th</sup> October 2007)

MORI (28<sup>th</sup> April 2004) *Public Support For Tax On Shopping Bags* [online] Available from: <http://www.ipsos-mori.com/polls/2003/meb1.shtml> (Accessed 13<sup>th</sup> October 2007)

NNFCC (2007) *Renewable Polymers* [online] Available from: <http://www.nnfcc.co.uk/metadot/index.pl?id=2197;isa=Category;op=show> (Accessed 13<sup>th</sup> October 2007)

Porter, R, 2002. *The Economics of Waste*. Washington: RFF Press

Reusablebags.com (2007) *Facts and figures regarding the true cost of plastic bags* [online] Available from: <http://www.reusablebags.com/facts.php> (Accessed 13<sup>th</sup> October 2007)

Scottish Government (2005) *Proposed Plastic Bag Levy - Extended Impact Assessment: Volume 1: Main Report* [online] Available from: <http://www.scotland.gov.uk/Publications/2005/08/1993154/32037> (Accessed 13<sup>th</sup> October 2007)

UNEP/Regional Seas (2005) *Marine Litter: An analytical overview* Available from: [http://www.unep.org/regionalseas/marinelitter/publications/docs/anl\\_oview.pdf](http://www.unep.org/regionalseas/marinelitter/publications/docs/anl_oview.pdf) (Accessed 13<sup>th</sup> October 2007)

Waitrose (2007) *Waste and Recycling* Available from: <http://www.waitrose.com/food/foodissuesandpolicies/packaging.aspx> (Accessed 13<sup>th</sup> October 2007)

Washington Post (2007) *Paper or Plastic* [online] Available from: <http://www.washingtonpost.com/wp-dyn/content/graphic/2007/10/03/GR2007100301385.html> (Accessed 13<sup>th</sup> October 2007)

Weiss, K (2<sup>nd</sup> August 2006) *Plague of Plastic Chokes the Seas* [online] Available from: <http://www.latimes.com/news/local/oceans/la-me-ocean2aug02,0,3130914.story?page=1> (Accessed 13<sup>th</sup> October 2007)

Which? (27<sup>th</sup> September 2007) *Supermarkets act on plastic bags* [online] Available from:  
[http://www.which.co.uk/reports\\_and\\_campaigns/house\\_and\\_home/Reports/environment/bags\\_news\\_article\\_557\\_122744.jsp](http://www.which.co.uk/reports_and_campaigns/house_and_home/Reports/environment/bags_news_article_557_122744.jsp) (Accessed 13th October 2007)

Williams, C (11<sup>th</sup> September 2004) *Battle of the bag*. New Scientist Issue 2464 [online] Available from: <http://www.newscientist.com/article/mg18324644.800> (Subscription required) (Accessed 13<sup>th</sup> October 2007)

WRAP (7<sup>th</sup> September 2007) *Biopolymers need careful introduction, says WRAP* [online]  
Available from:  
[http://www.wrap.org.uk/wrap\\_corporate/news/biopolymers\\_need.html](http://www.wrap.org.uk/wrap_corporate/news/biopolymers_need.html) (Accessed 13th October 2007)