



**Environment Group Research Report  
Proposed Plastic Bag Levy -  
Extended Impact Assessment**

2005  
Research Summary 2005/06

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ISBN: 0-7559-2687-0

Scottish Executive  
St Andrew's House  
Edinburgh  
EH1 3DG

Produced for the Scottish Executive by Astron B42645 08/05

Published by the Scottish Executive, August, 2005

Further copies are available from  
Blackwell's Bookshop  
53 South Bridge  
Edinburgh  
EH1 1YS

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# Acknowledgements

This report was commissioned by the Waste Strategy Team in the Environment and Rural Affairs Department at the Scottish Executive. The report was produced by AEA Technology Environment and associates.

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AEA Technology Environment is grateful for the direction and support received from the steering committee throughout this project:

- Scottish Executive Waste Strategy Team
- Carrier Bag Consortium
- Convention of Scottish Local Authorities (CoSLA)
- Friends of the Earth Scotland
- Scottish Retail Consortium
- Scottish Environment Protection Agency (SEPA)

# Glossary

ARA	Australian Retailers Association
BRA	Belgian Retail Association
BRC	British Retail Consortium
CBC	Carrier Bag Consortium
CoSLA	Convention of Scottish Local Authorities
Defra	Department for Environment, Food and Rural Affairs (London)
ERM	Environmental Resources Management
HDPE	high density polyethene (polyethylene)
INCPEN	Industry Council for Packaging and the Environment
KSB	Keep Scotland Beautiful
LCA	Life cycle assessment
LDPE	low density polyethene (polyethylene)
LEAMS	Local Environmental Audit and Management System
MCS	Marine Conservation Society
NO <sub>x</sub>	nitrogen oxides
ONS	Office of National Statistics
RMIT	Royal Melbourne Institute of Technology
SME	small-to-medium enterprise
SRC	Scottish Retail Consortium
SWAG	Scottish Waste Awareness Group
UCD	University College Dublin
VOC	volatile organic compound
WRAP	Waste and Resources Action Programme

# Proposed Plastic Bag Levy - Extended Impact Assessment

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## Introduction

Mike Pringle MSP has tabled a Members Bill in the Scottish Parliament to impose an environmental levy on specified plastic bags. If passed, this legislation would cover all plastic bags provided by retailers at point-of-sale or from other outlets. The inspiration for this bill was taken from the experience of the plastic bags levy (the so-called PlasTax) in the Republic of Ireland.

The Scottish Executive commissioned this brief study from AEA Technology Environment and associates, to address the likely impacts of such a levy and variants of it on:

- The environment.
- Consumers.
- Business.
- Waste.
- Local authorities.

Advocates of a levy on plastic bags cite the main benefits as being reduced littering (including marine litter), reduced use of resources and energy, lower pollutant emissions and increased public awareness of environmental issues.

Opponents argue that lightweight plastic carrier bags are hygienic, convenient and durable, that they are often reused for other purposes, that they form only a small part of the litter stream and that they have a lower overall environmental impact than paper bags. They also claim that a levy would impact unfairly on poorer households and would lead to job losses in Scotland (from reduced plastic bag manufacturing and importing).

The study has considered these, and other arguments, for and against a levy, quantifying the probable effects wherever possible. It considered a range of different scenarios:

- Scenario 0: No levy, i.e. business as usual.
- Scenario 1A: A levy of 10p on plastic but not paper bags, covering all businesses (as proposed in the Bill).
- Scenario 1B: A levy of 10p on plastic but not paper bags, covering all businesses except small and medium sized enterprises (SMEs) and charities.
- Scenario 2A: A levy of 10p on plastic and paper bags, covering all businesses.
- Scenario 2B: A levy of 10p on plastic and paper bags, covering all businesses except SMEs and charities.

A wide range of evidence has been used to inform the study. This includes experience from the PlasTax in Ireland and voluntary schemes in the UK along with results from life cycle analysis (LCA) studies from France and Australia.

The study does not make a judgement on whether, on balance, such a levy should be introduced, but provides evidence on the main effects expected under each of the four levy scenarios.

## **Overall Effects**

A levy would cause a set of interacting effects. The study is predicated on evidence that a levy would stimulate a switch away from use of plastic bags (by typically 90%). If only plastic bags were to be levied (scenarios 1A and 1B), then studies and experience elsewhere suggest that there would be some shift in bag usage to paper bags (which have worse environmental impacts). This study is based on this experience of behaviour change.

In each of the areas considered – environment, consumers, business, waste and local authorities - there would therefore be a complicated set of effects, but in general:

**Environment** The environmental impact of each of the four levy scenarios was assessed using 8 indicators. These include energy, water, waste and litter. Under the levy as proposed (scenario 1A) 5 out of the 8 indicators show an improvement.

There are different impacts under each levy scenario. In particular, including paper bags increases the potential environmental benefits of a levy (e.g. scenario 2A or 2B) where all 8 indicators improve.

In all cases the changes in environmental indicators due to a levy are modest (i.e. 1% or less) in comparison to overall environmental impacts from other activities in Scotland (as shown in Table A3.7).

**Consumers** Consumers act to reduce the financial impact by switching away from use of carrier bags. This limits the detrimental financial impact for consumers to a maximum of £10 per person per year.

**Business** The impacts would be positive for food retailers, and detrimental for non-food retailers and other businesses such as plastic bag manufacturers.

**Waste** Under scenarios 1A and 1B waste increases due to a switch from plastic to paper bags. When paper bags are included in the levy (e.g. scenario 2A or 2B) waste arisings fall. The greatest increase, 5,409 tonnes, is for scenario 1A, while the greatest decrease, 4,993 tonnes, is for scenario 2A. These should be compared against total household waste arisings of 2,094,872 tonnes pa [SEPA], a 0.26% increase and a 0.24% decrease respectively.

In all scenarios litter reduces, but plastic bags are only a small percentage of reported litter.

**Local authorities** There will be set-up costs and on-going costs to administer the levy. In general the revenue from the levy is expected to cover the on-going administration costs. However there are important differences between the on-going costs and revenues between local authorities. For example smaller authorities could receive lower revenues without a proportional reduction in administration costs.

## **Impacts on the Environment (Section 4 in the main report)**

The study used an LCA approach to evaluate the changes in a range of different environmental indicators (e.g. energy use, water use, waste etc). The analysis shows that there would be an environmental benefit for some of the indicators depending on consumer behaviour were a levy to be introduced.

In all four levy scenarios, consumption of non-renewable energy, atmospheric acidification and formation of ground level ozone and the risk of litter would be considerably less than the current situation.

In scenarios 2A and 2B, where the levy is applied to paper bags as well as plastic bags, these environmental benefits increase. In addition there are reduced impacts in terms of consumption of water, emissions of greenhouse gases and eutrophication of water bodies (rivers, lakes, etc.). This is because paper bags have a higher environmental impact in these categories relative to plastic bags.

As these results depend on key assumptions used, we undertook a sensitivity analysis to assess how the results change under different assumptions. This shows that scenarios 1A and 1B, which increase use of paper bags, are more sensitive to key assumptions than scenarios 2A and 2B. Including SMEs in the levy (scenarios 1B and 2B) accentuates the impacts.

For each of the environmental indicators used in this study we have assessed the total impact from all activities in Scotland. This analysis shows that the environmental benefits in all indicators from a levy are modest (i.e. 1% or less) when compared to overall environmental impacts from other activities in Scotland.

## **Impacts on consumers (Section 5 in the main report)**

Consumers would pay the levy itself overtly, on levied bags they continue to use. The true additional financial burden on consumers depends on a number of other factors. This draws upon experience from Ireland of the change in behaviour and therefore bag use. The total cost was calculated from the amount of levy paid for carrier bags, the relative hidden costs of plastic and paper bags<sup>1</sup>, the costs of buying additional heavyweight plastic carrier bags (so-called 'bags for life'), the costs of buying additional bin liners, and additional VAT.

The cost to the consumer also depends on whether or not certain costs (in particular the 'hidden costs/savings') are passed on to the consumer by the retailer.

This leads to a wide range of estimated costs to consumers, depending on assumptions. In Scenarios 1A and 1B (no levy on paper bags) these range from £7.41 to £10.58 per year. In Scenarios 2A and 2B (levy on paper bags as well) the range is from £2.50 to £6.11 per year.

Including paper bags in the levy would therefore reduce the financial burden. Indeed this has a bigger effect on the range than whether or not SMEs are included.

These estimates should be compared with average household expenditure in Scotland, at £365 per week.

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<sup>1</sup> Hidden costs cover the purchase, transport and storage of bags by a retailer, normally passed on to consumers through the price of goods.

## **Impacts on business (Section 5 in the main report)**

### **a) Retailers**

After taking set-up and administrative costs into account, the food retail industry would benefit from net cost savings from the proposed bag levy. Savings would result from having to buy far fewer plastic carrier bags (now usually given away for free<sup>2</sup>), while sales of 'bags for life' and bin liners would increase.

However, this would not be the case for non-food retailers (e.g. clothing), as experiences in the Republic of Ireland following the introduction of the so-called PlasTax has seen a more pronounced shift to paper bags in these stores.

In terms of systems needed to comply with the proposed levy, larger retailers are expected to find this easier, having computerised systems and greater resource available. Smaller retailers may well not have computerised systems and the levy would thus represent a greater burden

### **b) Other business**

There are an estimated 15–20 manufacturers, importers and distributors of plastic carrier bags in Scotland, most of which are SMEs. All will be affected by the proposed levy. It is believed that the imposition of a plastic bag levy in Scotland would lead to job losses, as it is considered unlikely that plants that currently manufacture plastic carrier bags would switch to alternative products (e.g. production of bin liners). Losses have been estimated at between 300 to 700 direct jobs, with further indirect jobs being affected.

## **Impacts on Waste (Sections 4 and 5 in the main report)**

In all four levy scenarios, the total number of carrier bags (lightweight and heavyweight plastic and paper) used in Scotland per year would decline as a result of the levy. However, if paper carrier bags are not subject to the levy (as in scenarios 1A and 1B), the total tonnage of all carrier bags used and requiring disposal actually increases by 5,409 tonnes for scenario 1A (the proposed levy). Scenario 2A (including paper in the levy) would yield the greatest reduction in the tonnage of waste relative to current levels (a reduction of 4,993 tonnes per year). For comparison, in 2002/03 household waste in Scotland was 2,094,872 tonnes [SEPA] and 5,409 tonnes extra represents a 0.26% increase, whilst a 4,993 tonnes less equates to a 0.24% decrease.

This analysis suggests some potential for an increase in solid waste generation for scenarios that favour a switch to paper bags. This is due to different assumptions about the relative weight of plastic and paper bags, and the fact that the LCA looks at solid waste impacts throughout the bag life cycle rather than just the end-of-life disposal phase.

## **Impacts on local authorities (Section 6 in the main report)**

Preliminary estimates suggest that the application of the levy to all businesses could cost Scottish local authorities, collectively, about £3–4 million to set up and £3.5 million per year to manage. This would reduce to £1.5–2.5 million to set up and £1.75 million per year to manage if the levy was applied selectively, i.e. based on retailer size or function.

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<sup>2</sup> Some stores in independent initiatives already charge for their lightweight carrier bags.

These costs could be more than offset by revenues from the levy estimated at £7.75 million per year for all businesses and £5.5 million per year if applied selectively. However, smaller local authorities could receive lower revenues without a proportional reduction in administrative costs.

The Convention of Scottish Local Authorities (CoSLA) has reservations about the duty of collection falling to the local authorities and its concerns regarding the magnitude and potential administrative costs of the Levy, which they believe needs a full investigation.

### **Alternatives to the levy (Section 3 in the main report)**

In addition to the assessment of the impacts of the levy scenarios, the study examined the details of alternatives to the levy.

The Carrier Bag Consortium (CBC) has developed a draft voluntary code to develop waste reduction and reuse initiatives and to continue product engineering to make further savings in the production, transportation and storage of plastic carrier bags. This has been submitted to the Voluntary Code of Conduct working group set up by the British Retail Consortium (BRC) and the Scottish Retail Consortium (SRC).

A voluntary approach has already been adopted in Australia, where use of carrier bags fell by 20.4% between 2002 and 2004.

### **Report Structure**

This summary provides a brief introduction to the analysis methodology and results of the study. The main sections of the report are included in Volume 1, while Volume 2 provides the detailed appendices.

## Conclusions

This brief study has assessed the main impacts of the proposed levy and a number of variants to the levy. A levy would cause a set of interacting effects. The study is predicated on evidence that a levy would stimulate a significant switch away from use of plastic bags.

In each of the areas considered – environment, consumers, business, waste and local authorities - there would therefore be a complicated set of effects, but in summary:

**Environmental** impacts were assessed by examining how the levy would change eight environmental indicators. Our analysis suggests that there would be environmental benefits in some indicators, depending on what consumers decide to use in place of plastic bags e.g. not using a bag at all or using a different type of bag e.g. paper bags or bags for life. The environmental benefits are greater if paper bags are included in the levy. A sensitivity analysis was used to test how the results change under different assumptions. This shows that levy scenarios that increase use of paper bags, are more sensitive to key assumptions than levy scenarios that do not. Including SMEs in the levy accentuates the impacts. The environmental benefits are modest when compared to total environmental impacts from other activities in Scotland.

**Consumers** will pay the levy directly. Experience from Ireland shows that consumers switch to other forms of bags or reduce use of bags, reducing the financial impact on consumers. This leads to a wide range of estimated costs to the consumers, depending on assumptions. For the levy as proposed the estimated cost per consumer is £10.58 per year. If paper bags are included in the levy and SME outlets are excluded, this is estimated to fall to £2.50 per year. This compares to average household expenditure of £365 per week.

In terms of **waste**, plastic bags waste would reduce, but paper bags waste is expected to increase. It is estimated that the levy as proposed could increase waste by 5,409 tonnes pa, however this is equivalent to a 0.26% increase in total household waste. Including paper bags in the levy would reduce waste by about 4,993 tonnes pa, a 0.24% decrease.

The impacts on **business** vary from sector to sector. Food retailers are likely to see net benefits, through lower costs for the purchase of plastic bags. Non food retailers are likely to see costs increase as purchases of paper bags will increase. Manufacturers of plastic bags will see reductions in business with the potential loss of 300 to 700 direct jobs.

For **local authorities** there will be costs for the set up and on-going administration of the levy. In total these are estimated at £3–4 million and £3.5 million pa respectively. These costs will be offset by income from the levy estimated at £7.75 million pa. CoSLA has reservations about the potential costs, which they believe needs a full investigation.



Small changes in the way we perform everyday tasks can have huge impacts on Scotland's environment.

Walking short distances rather than using the car, or being careful not to overfill the kettle are just two positive steps we can all take.

This butterfly represents the beauty and fragility of Scotland's environment. The motif will be utilised extensively by the Scottish Executive and its partners in their efforts to persuade people they can do a little to change a lot.



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Astron B42645 08/05

ISBN 0-7559-2687-0



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