



The Retail, Wholesale and International Trade Representation to the EU

**Environment &
Logistics**

THE USE OF LCAs ON PLASTIC BAGS IN AN IPP CONTEXT

REPORT

September 2004

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EXECUTIVE SUMMARY

In June 2003, the Commission published a communication on Integrated Product Policy – building on environmental Life-cycle thinking. The IPP approach is aimed at contributing to sustainable development and is based on five key principles: life-cycle thinking, working with the market, stakeholder involvement, continuous improvement, a variety of policy instruments. Furthermore the EU - IPP strategy is linked to the other thematic strategy of the sixth environmental action plan, mainly the recycling thematic and the resource use thematic.

Within the IPP thematic strategy, the Commission set up the IPP regular meetings consisting of the Commission, Member states and relevant stakeholders (among others EuroCommerce). The main objective of those meetings is to obtain a better coherence between the IPP tools mentioned in the communication (LCA, environmental labels, eco-design, environmental management system, voluntary agreements, regulation, etc) as well as integration between them. The final aim is to achieve a better environmental protection and a strategic vision and action plan for IPP. The starting point of the discussions is the IPP activities already carried out in the Member States and in the industry sectors. Based on the achievements and experiences – negative and/or positive - of IPP in the Member States and in the stakeholder groups, the Commission will revisit existing IPP tools and/or legislation in order to have a continuous improvement in this field.

Therefore, EuroCommerce decided to look at a specific issue the commerce sector is working on –the plastic bags- and analyse this product in an IPP context.

The specific objective of this report is to assess how, in real life, the retail sector implements IPP tools on this particular product, and what should be improved to reach a coherent integrated product policy. As LCA is an important tool for IPP and for business-decision making, the study starts with the review and conclusions of the different LCAs on plastic bags among which the LCA realised by Carrefour is of particular relevance. Thereafter, we analysed the policy instruments (tax, voluntary agreements, labels, eco-design, etc.) put in place by national authorities (like Ireland, the UK, Australia, Belgium, etc) and/or by the retail sector. We then see if the plastic bags issue has been dealt with by implementing other IPP tools like eco-design and environmental labelling. For each country, conclusions are drawn.

The principal aim for the different interested parties to carry out the LCAs was to take the best policy instruments to resolve the problem of plastic bag litter. The main conclusions of those studies showed that there was significant potential to reduce life cycle environmental impacts of plastic bag usage in the form of resource consumption, energy, greenhouse gas emissions and litter. It further showed that a substantial shift to more durable reusable bags would deliver environmental gains over the full life cycle of the bags. Heavy duty reusable plastic bags with a long usable life were found to achieve the greatest environmental benefits. Little or negative gain was found to be derived from the shift from single use 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.



The policy instruments chosen are divergent from country to country and from retailer to retailer.

Ireland took the political decision to implement a plastax. Scotland is developing a law to implement a plastax based on the Irish experience, but not for the moment based on a LCA. Australia favours a mix of approaches based on a LCA, among them more studies and voluntary approach, but not excluding the tax. France and Belgium follow a voluntary approach, not based on LCA.

The retail sector has always advocated for a voluntary approach in the reduction of one way plastic bags and has done so really successfully with voluntary actions in their shops, without specifically basing their decisions on LCAs. The example of the referendum on plastic bags in Corsica is a good example of a voluntary initiative which ended successfully.

But the retail sector has in some cases reacted with proactive voluntary approach to avoid possible tax measures of the national authorities.

In France, Carrefour realised its own LCAs to assess which policy measures they will take on the basis of a scientific study. As a result of this LCA, they decided to have the plastic bags NF environnement certified and to make awareness campaigns in shops to change the consumer behaviour. Carrefour has been the sole retailer so far to go from a LCA towards the other IPP tools, in this case environmental labelling.

In general, we cannot say that the approach to plastic bags within the retail sector is taken from an IPP perspective, with designed and proactive policies in this field. However, the sustainability concept has always been present in the voluntary activities carried out by the retail sector. The LCA carried out by Carrefour showed that the reusable bag is more sustainable than the one way plastic bag. Nevertheless, in terms of sustainable development, we are still a long way off from the other two pillar of the EU sustainable development strategy (including hygiene, security and safety, jobs, children labour, worker's union). The question to be asked then is: should we go from an integrated product policy (from raw material to sound disposal) to a sustainable product policy including the three dimensions of sustainable development?

As a main conclusion, we can say that the retail sector is striving for a life-cycle approach in product policy (in this particular case: plastic bags) but there is up to now no clear policy of the commerce sector on how the IPP tools (LCA, voluntary agreements, regulations, labels, EMS, eco-design) should be integrated. We are still on the starting blocks.

This report would not have been possible without the help of EuroCommerce members and PlasticsEurope. We thank them for their contribution.

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I. "LCAs" OF PLASTIC BAGS

A. Overview of the major reports done in this field

1. Environmental impact assessment of Carrefour bags (December 2003)

It is the most recent LCA realized according to full ISO 14040 with a critical review organized by the French environmental agency (ADEME). The aim of this LCA is to quantify the environmental impacts of Carrefour shopping bags (plastic, paper) within different waste treatment (landfill, incineration, recycling). This LCA was realized for the different European locations where Carrefour is established (mainly France, Belgium, Spain and Italy).

With the results of such a robust study, Carrefour will be able to develop a reliable argumentation catalogue to discuss the issue of plastic bags reduction and the interest of using biodegradable plastic with interested parties (providers, NGOs, public authorities and consumers).

The result of this study will be used by Carrefour as a policy tool in this field. The whole idea behind the study is to strive for a sustainable use of plastic bags.

2. Environment Australia – Plastic shopping bags-analysis of levies and environmental impacts (final report: December 2002)

This study is recent but the life cycle impact session is short. A full LCA is done but we do not know if according to ISO 14040. The main issue raised by Australia environment is to propose policy options and instruments to tackle the issue of litter caused by one-way plastic bags. The fact that the latter are not more environmentally damaging than other alternatives does not impede authorities to strive for a reduction of plastic bags due to the amenity problem caused by litter coming from one-way plastic bags. This report is representative of the Australian situation.

To sustain their policy option, a section is dedicated to the life cycle assessment. The aim of the section is to study the environmental, social and economic impacts for 11 bag types.

3. Consultancy study on plastic bags in Ireland (1999)

This analysis led to the introduction of the tax on plastic bags in Ireland. The report does not provide a full LCA according to ISO 14040. It analyses the issue of litter and specifically the litter due to plastic bags trying to find the best solutions to tackle the problem. The report is representative of the Irish situation. One chapter of the report is dedicated to life cycle assessment of plastic shopping bags. However, the section is very short (3 pages) and refers to the Winnepeg study and a so-called pre-consultant study.



4. LCA of Bags in Mater bi (1996)

This LCA was done according to ISO 14040. The aim was to study the environmental impact of bags in Mater bi versus PE bags and paper bags. This study is representative of Switzerland.

Report on environmental impacts of plastic bags versus paper bags dated 1996

5. The Winnipeg packaging: comparison of grocery bags (1990)

This study is important as it has been used as a reference study in the Irish consultant analysis of the litter issues in Ireland and the best way to tackle it. Nevertheless, the Winnipeg research is not a full LCA according to ISO 14040.

Indeed, ISO standards did not exist at that time! It is a single impact study (energy use).

The report compares five studies on grocery bags (between 1974 and 1990). The author considers that this validates former individual studies' results (consistency analysis).

The report aims to help consumers choose among alternatives for using grocery bags by estimating the energy intensity of various options. It compares reuse, recycling and disposal for four different types of bags (permanent, multi-trip, plastic one trip and paper one trip).

It should be noted that the (old) data, some questionable assumptions and the detailed results of this report cannot be considered as representing the present situation for grocery bags. The consistency of **ranking and trends** versus time can nevertheless be considered as giving good indications, confirming for the past the results of the most recent study (Ecobilan/PWC for Carrefour) on the same issue.

B. Detailing the various "LCAs"

1. Environmental impact assessment of Carrefour bags (December 2003)

Types of bags (capacity in litres): 1-way PE (14) or paper (20), Mater-bi (25), reusable PE (37)

Full LCA according to ISO. Critical review organised by the French EPA (ADEME).

8 indicators (non-renewable energy consumption, water consumption, greenhouse gases emissions, air acidification, photochemical oxidants, eutrophication, residual solid waste, littering probability)

Materials production (paper, plastics, starch, glues ...) is the dominant source of environmental impact for all types of bags and for most of the indicators. As a consequence, weight minimisation and reuse are dominant improvement parameters for all types of bags.



Bags manufacture generates lower impacts than materials production. The use of solvent-based inks (for PE bags) can be an important source of photochemical oxidants.

The **end-of-life step** (incineration or disposal) contributes mainly to three indicators (littering probability, residual solid waste, GHG emissions). Incineration generates dioxins, but the quantities are continuously decreasing, and shopping bags have a minor contribution to this generation.

The report says that shopping bags are not themselves a source of dioxin generation, but that their carbon skeleton contributes to feeding the dioxin production reaction. This not wrong, but with or without plastic shopping bags, this happens anyway. And the statement is true for all combustible items (paper, textile, wood, board ...);

Furthermore the dioxine generation in MSWIs is not due to shopping bags, but to

- the presence of halogens in the waste (I don't know any coming from plastic shopping bags used so far), the main source of which is the table salt contained in food residues or in plants, wood ...
- the operational conditions of the MSWI (temperature \rightarrow 850°C, dioxins are decomposed in the furnace- and gas quenching regime);

The quantity of chlorine from table salt, available in MSW, is exceeding by many orders of magnitude what is converted into dioxins (MSWI are dioxin sinks, provided that the "de novo" generation –between 650 and 450 °C, when cooling the combustion gases- is prevented by severe quenching, which is the case in all modern MSWIs.

Basis for the comparison (base case)

- Same functional unit: packaging of 9000 litres of goods (a typical annual purchase volume)
- French mix of waste management options (49% incineration, 51% land filling, 45% paper recycling)

Results:

- For all indicators, **PE reusable bag is always better than one-way bags, when reused at least 4 times.**

Compared to the one-way PE bag, the other one-way bags rank as follows:

| | One-way paper bag | Biodegradable bag |
|-------------------------------------|-------------------|-------------------|
| Consumption of non-renewable energy | = | = |
| Water consumption | - (3 x more) | = |
| GHG emissions | - (80-90% more) | - |
| Air acidification | - (80-90% more) | - (40-60% more) |
| Photochemical oxidants | = | + |
| Eutrophication | - | - (11 x more) |
| Residual solid waste | - | = |
| Littering probability | + | + |

+ better = equal - worse



One-way PE bag looks rather better than the other one-way bags, but for the littering probability, its main weak point, particularly in coastal areas.

Sensitivity analyses (reuse -up to 65%- of 1-way PE bag as kitchen bin liner, paper bag reused once, 100% land filled or 100% incinerated at the end of life, 30% recycling of PE reusable bag) do not change significantly the results here above. Reusing 1-way PE bag as bin liner improves really its performance, as does the reuse for the paper bag, but reusable PE bag remains better for all indicators when reused 4-7 times.

Conclusion (very reliable study, up to date):

- Reusable PE bag, if reused at least 4 times, offers the best potential for reducing the environmental impact of shopping bags.
- The next preferable option is the one-way PE bag, reused e.g. as bin liner, and sent to energy recovery.
- The trends and ranking can be extrapolated to other contexts (other mix of waste management options, other electricity grids; the detailed results have to be recalculated on the basis of appropriate detailed data.

2. Environment Australia – Plastic shopping bags-analysis of levies and environmental impacts (final report: December 2002)

From the section dedicated to the life cycle impacts, we can deduce the following:

Types of bags: singlet HDPE, 50% recycled HDPE, boutique LDPE, Coles Calico, woven HDPE Swag Bag, PP fibre “green bag”, kraft paper-coles handled, solid PP smart, reusable LDPE, biodegradable starch based, and biodegradable PE with prodegradant additives

4 indicators used: material consumption, litter, greenhouse gas emission, primary energy use

Covers disposal issues, mainly landfill, recycling or litter

Basis for comparison: a household carrying approximately 70 grocery items home from a supermarket each week for 52 weeks

Indicator on litter potential for different options. Choice to represent litter by three indicators. These are:

- Mass of material finding its way into the litter stream – representing mass of Resources lost from recovery options;
 - The area of ground covered by litter – measure in metres squared (m²) and based on the maximum area which a bag could cover if lost to the litter stream;
- and
- The persistence of litter measured in metres squared per annum (m²a) to represent the area covered by litter over time.



To model this last indicator an estimate of an average time a piece of litter may remain in the litter stream was needed. The data used for different materials was as follows:

- Plastics (both single use and multiple use but not biodegradable polymers) -5 years;
- Paper and biodegradable polymers – 6 months;
- Calico bags – 2 years.

The study also takes into account any **avoided impacts** such as:

- Avoided use of virgin polymer or paper fibre due to bag recycling programs;
- Avoided consumption of kitchen tidy bags as a result of bag reuse in the home. This is the same as in the Carrefour study

Conclusions

The **woven HDPE bag** is the preferred option in all the following areas:

- Resource-efficiency in terms of material consumed in manufacturing, followed by the PP Smart Box and then non-woven PP bag;
- In terms of embodied energy and global warming potential, followed by the PP Smart Box and then reusable PP bag;
- In terms of primary energy used, followed by PP Smart Box and the non-woven PP bag;
- Lowest contribution to litter (using persistence as a measure), followed by the reusable PP bag and the calico bag;
- Among the single use bags, biodegradable and paper bags perform better than conventional HDPE and LDPE bags on litter persistence. They both achieved the same outcome against this indicator as they were both assumed to have the same size and to degrade over a 6-month period.

If we apply a **sensitivity analysis** (concerns about mixing different types of groceries, size of the bag, extent to which a reusable bag can be recycled at the end of life), we have the following results for the different bag options:

- The smaller reusable HDPE bag uses more material to achieve the functional unit, and as a result the reusable HDPE bag becomes equal to that of the PP Box. The next best alternative is the reusable PP bag;
- In terms of primary energy used, the preferred option is still the reusable woven HDPE bag, followed by the PP box and the reusable PP bag;
- In terms of global warming potential, the preferred option changes from the reusable HDPE bag to the PP Smart Box, followed by the reusable HDPE bag and the reusable PP bag;
- The smaller reusable woven HDPE bag no longer achieves the lowest contribution to litter (using persistence as a measure). The calico bag has the lowest impact against this indicator, followed by the reusable PP and HDPE bags which have the same impact.

3. Consultancy study on plastic bags (Ireland)

Within the section dedicated to the life cycle assessment, the consultants adopted the conclusions of the Winnipeg study. However, they reached quite another conclusion by using the indicators of the Pre-consultant study of 1996. **The indicators** used were summer smog, winter smog, heavy metals, acidification, greenhouse gas emission.

In that case, the environmental impacts scores of plastic and paper bags show that, I quote, "paper bags have greater impact than plastic bags in terms of contribution to winter smog and acidification. This is largely due to the greater energy intensity of paper bag manufacturing, a feature which is identified in all the LCA studies examined. Plastic bags on the other hand tend to come off worse in terms of emissions of heavy metals (plastic bags do not have heavy metals any more) and contributions to summer smog. The cause of this is not clear from the study.

This kind of assessment only reveals differences in relative impacts and says nothing about the importance of the impacts. This requires the impacts to be weighted. The Pre study attempts to do this using a weighting system based on how far away each impact is from a sustainable target level. Applying these weightings gives a single impact number for each type of bag. Using this approach plastic bags are shown to have a lower total impact score of 7.9 compared to paper bags with a score of 8.9.

On the basis of this analysis paper bags are shown to be more harmful to the environment than plastic bags, the difference in scores is small. Indeed the difference could well be within the bounds of uncertainty, making it difficult to draw any firm conclusions".

It should be noted that this study has not been critically reviewed as provided for in the ISO standard. So, its conclusions remain highly questionable.

The boundaries have been defined in such a way that the reuse of plastic shopping bags (for 80% of the bags - e.g. as bin liners- as confirmed by studies in UK, France and Australia) was excluded from the perimeter of the study. The immediate effect of the plastax, beyond the spectacular decrease in shopping bags used, was a spectacular increase in Rubbish bags sales. This was a significant benefit for European bag producers (shopping bags are essentially imported from Asia, while rubbish bags are still produced in Europe), but where was the benefit for the environment?

4. LCA of Mater bi bags (biodegradable)

Types of bags: kraft bags (weight 9.5g), PE bags (weight 7,04g) and bags made of Mater Bi (weight: 59,6g).

9 indicators used: Total energy consumption, global warming, acidification, nitrification, ozone formation, toxicity in air, toxicity in water, salification, waste produced.

Covers disposal issues, mainly composting for Mater BI bags and paper bags (not commonly used in Europe) and incineration for PE bags.

| Bags made of Mater bi compared with | | | |
|--|-----------|----------------|---|
| Environmental impact category | Paper bag | Bag made of PE | Bag made of PE, including incineration of the organic residue |
| Energy | ++ | 0 | + |
| Greenhouse effect | + | + | ++ |
| Acidification | + | 0 | ++ |
| Nitrification | ++ | 0 | + |
| Ozone formation | ++ | + | ++ |
| Toxicity in air | + | ++ | ++ |
| Toxicity in water | ++ | 0 | + |
| Salification | - | -- | ++ |
| Waste produced | ++ | -- | - |

- (++)= much better
- (+) = better
- (0) = comparable
- (-) = worse
- (--) = much worse

Conclusions

The life cycle analysis shows that bags made of **Mater-Bi™** clearly have a better environmental impact than paper bags, and are comparable with bags made of polyethylene incinerated alone after separation from the waste. However, experience of managing the composting process shows that complete separation of the plastic bag from the organic waste is not possible, as a significant quantity of non-separable organic material remains together with the plastic. This waste must be burnt together with the plastic. If we also consider this effect, the environmental impact of bags made of Mater-Bi™ is clearly better than bags made of polyethylene.

On the abovementioned conclusions, we can have the following concerns.

The end-of-life scenario assumes that Mater-Bi bags are collected for composting. Assuming that the alternative option is to recover energy via MSW incineration;

- What about the high proportion of bags ending in landfills/LF? Anaerobic biodegradation in land fill generates methane (23 x more powerful than CO2 for ozone depletion). As soon as 5% of the bags end in land fill and are buried deeper than 2m they degrade into methane and the famous CO2 neutrality (for the carbon feedstock part) benefit is lost. Capturing LF gas is never 100% efficient and cannot prevent CH4 losses in the atmosphere;
- what about the troubles created in existing recycling schemes due to the cross-contamination between oil-based and Mater-Bi bags?
- What is the proportion of Mater-Bi bags that can reasonably be respectively composted sent for energy recovery and land filled?
- Where are the schemes for separate collection of the compostable fraction of packaging waste?



This end-of-life issue was recently acknowledged as a crucial point for biomass-based plastics by experts at a conference organized in London (May 25th 2004) and on the learnings from LCAs on biodegradable plastics (organized by the UK Non-Food Crop Center).

5. The Winnipeg report

Types of bags (capacity in litres): reusable nylon (15), reusable LDPE bag (23), 1-way LDPE (15) or paper (23). The nylon bag is considered as permanent (more than 200 uses).

One single indicator: the energy intensity of the bags.

Covers reuse, recycling and disposal issues.

Basis for comparison: 1 million "bag-units" (=23 000 000 litres of goods)

| | 1-way plastic bag | 1-way paper bag |
|--|-------------------|-----------------|
| Feedstock material intensity (t / mio bag-units) | 14.3 -16.5 | 62.8 - 68.2 |
| Energy intensity -feedstock + process energy- (GJ / mio bag-units) | 1060 -1662 | 2630 -3401 |
| Fossil fuel use * (GJ / mio bag-units) | 1061 - 1657 | 865 - 1629 |
| Atmospheric emissions** (t / mio bag-units) | 0.41 - 2.61 | 1.13 - 6.48 |
| Waterborne emissions ** (t / mio bag-units) | 0.01 - 0.33 | 0.04 - 2.53 |

* Many factors, incl. questionable assumptions, can explain the extent of the range

** From three studies only. Two studies did not report these emissions.

Paper bags are twice as energy-intensive as plastic bags (based on technologies of the 70's-80).

Energy intensity with 75% recycling rate for plastic and paper bags (KJ/per trip)

| | Plastic bag KJ | Paper bag KJ | "Permanent" Nylon bag | | |
|--|----------------|--------------|-----------------------|-----------------------|-----------|
| | | | KJ | # trips to break-even | |
| 11 shopping trips | | | 1089 | vs. plastic | vs. paper |
| 100 shopping trips | - | - | 120 | | |
| 200 shopping trips | - | - | 60 | - | - |
| 1-way bag / one trip | 1047 (1400) | 1344 | - | 11(9) | 9 (5) |
| 1-way bag / 2 trips | (700) | | | | |
| 1-way bag / 5 trips (NB: Unrealistic!) | - | 269 | - | - | 45 (22) |
| 1-way bag / 10 trips (NB: Unrealistic!) | 105 | - | - | 114 | - |
| Reusable bag / 25 trips (! Very optimistic!) | 165 | - | - | 72 (56) | - |
| Reusable bag / 40 trips | 103 | - | - | 116 | - |

NB: 75% recycling rate for 1-way bag is unrealistic. See (...) values for 0% recycling. No energy recovery taken into account. Reuse of 1-way plastic bags as bin liners is not considered in the study.

Conclusions

(to be taken with care. Detailed results and figures are outdated. Trust only the trends)

Grocery bags **reuse** is the least energy-intensive alternative: the "permanent" nylon bag is the **best option**.

Reuse reduces the energy-intensity per trip more than recycling.

For the one-way bags, **plastic bags are less energy-intensive** than paper bags, as validated by five reports compared in the Winnepeg analysis.

C. Main conclusions of the various report and LCAs

The 5 reports are very divergent and not based on the same hypothesis, methodology and functional unit. This makes the comparison difficult. Nevertheless we can distinguish clear trends.

1. **Reuse** seems to be the sustainable option if the reusable PE bag is reused at least 4 times. This means that the environmental impact of the reusable plastic bags and their performance versus one way packaging heavily depends on the number of reuse and thus on the consumer behaviour. In any policy decision, this needs to be taken into account.
2. The next preferable option is the one-way PE bag, **reused e.g. as bin liner**, and sent to **energy recovery** (incineration)
3. Plastic bags are **less energy intensive** than paper bags at the production phase
4. One way plastic bag ranks better than one-way paper bag and biodegradable bag but the littering probability is its main weak point, particularly in coastal areas. So paper bags are not more environmentally friendly than plastic bags.
5. **Bio-degradable bags**. Data on biodegradable plastic bags is the least reliable of all as very little LCA work as been done on starch based plastics to date. It should therefore be treated with particular caution. According to the analysis, the biodegradable bag consumes less energy than the conventional HDPE bag, and is roughly equivalent in global warming potential. It uses more material because the reference bag used for the review is double the weight of the HDPE singlet bag (12.5g compared to 6g). It has a lower impact on litter due to the faster rate of degradation. The biodegradable plastic bag has a lower contribution to global warming and lower embodied energy than the paper bag.

In summary we can say that there is significant potential to reduce life cycle environmental impacts of plastic bag usage in the form of resource consumption, energy*, greenhouse gas emissions and litter.

A substantial shift to more durable reusable bags would deliver environmental gains over the full life cycle of the bags. Heavy duty reusable plastic bags with a long usable life were found to achieve the greatest environmental benefits.

Little or negative gain was found to be derived from the shift from single use 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.

*Feedstock energy is recoverable at the end of life of the bags, for any type of bags sent to combustion. Process energy, the one that was spent for producing, using, collecting and disposing of the bags, is lost once for ever. When comparing energy needs for various types of bags, this distinction has always to be kept in mind.

II. MAIN POLICY DECISIONS TAKEN ON THE BASIS OF THE REPORTS.

A. Ireland

Introduction

The Irish government wished to resolve the problem of litter due to plastic bags which appears as a source of considerable, if unquantifiable, nuisance and environmental disamenity. Nevertheless, it should be highlighted that litter coming from plastic bags is more a problem of perception rather than a real issue as nobody up to nowadays has been able to calculate the environmental nuisance due to litter from plastic bags. It is good to know that plastic bags, despite very visible and persistent, represent a minor fraction of the litter (<1% wt) and that less than 1% of the bags are littered.

Having assessed a range of policy instruments the Irish government considered that a levy at the point of sale offered the most appropriate means of reducing consumption of plastic bags and thereby reducing litter. Options to encourage plastic bag recycling have not been considered as opportunities for recycling are limited in Ireland due to the lack of infrastructure both in terms of collection and processing.

Results of the application of the tax

The Irish plastic bag levy was introduced on 4 March 2002. No levy was introduced on paper bags.

a. Bag reduction

In recent consultation with major Irish retailers, the sustained reduction of plastic shopping bags has been confirmed. The overall reduction is estimated at over 90%, with major supermarkets Tesco and SuperQuinn experiencing 92% and 94% reductions respectively. These retailers predict that rather than an increase in plastic shopping bag consumption over time that the reduction rate will stabilise at 95-96% of pre-levy consumption.



b. Litter reduction

There is no data yet available to determine the effect of the tax and the resultant bag reduction on the litter stream in Ireland.

c. Reusable bags and bags for life

As would be expected, in the initial year of the levy introduction, the sale of reusable bags and 'bags for life' (which are replaced free of charge by the retailer on return of damaged bags for recycling) have increased significantly.

SuperQuinn supermarkets have sold 1.4 million units of their signature 'green bag', and Tesco estimates that over the first year reusable bags sales have been approximately 1/3 of their previous number of free plastic bags. In Ireland these bags are now the dominant form of carrying groceries. It is expected that the number of reusable bags sold will decrease and stabilize over the coming year.

d. Paper bags

Plastic bags were replaced in shops by paper bags whose number considerably increased, not being necessarily more environmental. Paper bags have meant increased transport and storage costs. Also there is a higher incidence of "**double bagging**" (people using two bags instead of one) for strength.

Conclusions

The Encams (Keep Britain Tidy Group) survey LEQSE 30 September 2002 reports that, "in essence, better management, not more money, would often improve standards. The significant components of litter that are hazardous to health - notably dog fouling (which comprises 8% of litter in recreation areas) and broken glass (mainly from drinks bottles), are of particular concern. The most widespread source of commercial litter nation-wide is elastic bands dropped by postal delivery workers."

Even though one way plastic bags have been dramatically reduced by the tax, it does not mean as a consequence benefits for the environment as the problem of litter is not limited to plastic bags. Furthermore, the plastax increased the use of paper bags less environmental friendly than one way plastic bags. However, the tax permitted a shift to more sustainable plastic, i.e. reusable plastic bags and bags for life.

We can state that the plastic bag issue in Ireland has not been considered within the broader concept of sustainability, which would have led to more cautions about the paper bags usage. If we now see the plastic bag issue within an IPP perspective, we can state that the IPP tools (LCA, eco-design, labelling, etc) have not been taken into account in the decision of the plastax.

B. Australia

The Australian government has not taken any decision yet in respect of implementing measures to reduce the use of plastic bags. Nevertheless the national shopping bags working group made the following recommendations:

- It recommends that current and future waste management and landfill management practices be investigated and that specific nationally consistent guidelines be developed to assist landfill operators to minimize off site litter in a variety of locations and circumstances.
- The Group also recommends that in the short term, active support be given to current consumer awareness and anti-litter programs, and in the longer term, that the effectiveness of the current programs is examined, with proposals being developed for a coordinated national anti littering and consumer awareness campaign, specifically focused on plastic bag use.
- The Working Group has also developed management options designed to reduce, recycle and reuse plastic carry bags.
- To reduce the amount of carry bags used, the Working Group recommends the adoption and implementation by all retailers of a *National Code of Practice for Management of Plastic Retail Carry Bags* with defined targets and a comprehensive reporting system. The Australian Retailers Association drafted such a code in October 2003. Please see ANNEX I for more details.
- It also recommends consumers shift to more durable, reusable, and recyclable bags. In parallel with the development of the Code, the Working Group recommends that a proposal for the introduction of a levy on plastic bags also be developed. This proposal should set out an implementation process and include a full impact assessment as required by the Council of Australian Governments.
- To promote an increase in recycling, the Working Group recommends the National Packaging Covenant Council proceeds with its program to 'close the recycling loop' for plastic bags. It recommends that the Covenant Council investigate and develop mechanisms to improve the in-store recycling rate, and look at ways of encouraging the development of markets for the reprocessed resin, particularly the use of recycled resin in plastic carry bag production.
- The Working Group, cognizant of the divergent views and experiences with degradable plastics, recommends Standards Australia commence the development of a national standard for degradable plastics.
- The Working Group also recommends that a comprehensive study on the full impact of introducing degradable bags into the Australian marketplace, including the effect on plastic recycling, local manufacturing, and landfills, be undertaken as a matter of priority. Some members of the Group indicated their strong support for moving to biodegradable bags if they can be clearly demonstrated to deliver preferred environmental outcomes (see ANNEX II: voluntary Agreement between the Plastics and Chemical Industries Association and the Federal Government Department of Environment and Heritage (DEH)).



Overall, after investigating all the issues associated with the use and impact of plastic bags and their alternatives, the Plastic Bags Working Group recommends that a range of short and long term complementary initiatives be undertaken, rather than one approach in isolation. Any program designed to reduce plastic bag use and **eliminate litter must include a mix of approaches.**

Conclusions

Australia considers a litter issue to be combated in a sustainable way. Plastic bags are analyzed from various approaches and different coherent policy measures has been taken, from a voluntary measures (the Australian retail code of conduct) to the consideration of a tax through more survey and the use of reusable bags, being more sustainable. Other IPP tools like eco-design or environmental labels are not considered. The IPP approach is present at some stages but not radically in all stages.

C. France

In cooperation and upon a demand from the public authorities, the French Retail Association together with the individual retailers decided to publish their initiatives for a sustainable use of plastic shopping bags. Some of them had been taken some years ago and they are not necessarily based on LCAs.

Based on a survey carried out by IFOP in November 2003, 50% of the French population wished to keep on having free of charge plastic bags even though they were willing to change for more sustainable and paying alternatives (47%). Furthermore, the plastic bag is technically recyclable and the producer pays the fee for its recyclability to Eco-emballages.

Therefore, the French Retail Association with its members developed the following policy:

1. Retailers will systematically raise the awareness of the consumer at the point of sale so that they use the plastic bags optimally;
2. Retailers will offer alternatives to the traditional plastic bags, like reusable one;
3. Retailers will develop new technological solutions. The shops will strive to have their shopping **bags NF environnement (French eco-label)** certified.

Furthermore, the association prepared an argumentation catalogue to be used in the training of staff. This argumentation catalogue will be an integral part of the education of commerce employees (CQF – certificat de qualification professionnelle). It is estimated that in 2004, around 75000 cashiers will be trained and for 2005 this number is expected to rise up to 150.000 cashiers.

As we see, the reduction of plastic bags follows a multicriteria approach on a voluntary basis.

Based on this common policy, each retailer developed its own initiatives valid for the current year. We list here some of those initiatives from some retailers. Unfortunately, we cannot list all of them.



Carrefour

In order to have a scientific guidance tool for its own decision making process, Carrefour carried out a LCAs on plastic bags whose results has been developed in the first part of this report.

Nevertheless, already since 1996, Carrefour has been informing the consumer on the best way to eliminate the one way plastic bags and has made available to its clients payable alternatives (like the reusable plastic bag, the biodegradable bag, paper bags, etc).

Carrefour wishes to reduce annually by 5% the one way plastic bags.

The LCA carried out by Carrefour led it to take the following decision: the plastic bags will be NF environment certified.

Auchan and ATAC

Since January 2004, all their plastic bags are NF environnement certified. The criteria for awarding the label are very strict: no heavy metals in the inks like cadmium, lead or mercury; no white pigment used water inks.

Both will also strive for a reduction of 10% on one way plastic bags for 2004. This objective has been obtained at the end of March 2004. Therefore, a special training of the cashiers will be carried out in order to better communicate with the clients and urge them to use the bags optimally.

Since 1998, Auchan has proposed payable alternatives like reusable bags all recyclable.

Since 2001, in some supermarkets, Auchan has been collecting plastic bags. This service will be expanded to all Auchan and ATAC shops in 2004 and they will be recycled to be used in the composition of other Auchan plastic bags.

Monoprix

Since February 2000, the plastic shopping bags have been NF environnement certified. During 2004, the retailer will propose alternatives to the one way plastic shopping bags, like reusable plastic bags; it will train its staff to relay the information about plastic bags to the customers; finally it will organize awareness campaigns and actions.

Monoprix will certify the reusable NF environnement plastic bag by the end of 2004.

Champion

Its aim is to reduce by 5% annually the number of plastic bags. Champion proposes alternatives more sustainable like the other retailers as well as training action of the cashiers to be an effective information point with the consumers.

Champion gives 0, 10 euro per reusable bag to WWF.



Casino

The retailer was leading the campaign in France for the removal of one way plastic bag in Corse where the citizens decided after a referendum to go for reusable plastic bags. The other actions are similar to the retailers above-mentioned.

During the summer 2004, tests for plastic bags suppression have taken place at the Breton coast.

Cora

Cora proposes more sustainable alternatives than the other retailers. At the end of September 2004, any kind of plastic bags will be NF environnement certified. Cora wishes to reduce the one way plastic bags by 10% on a yearly basis.

Systeme U

During the sustainable development week 2004, Systeme U offered a reusable bag to each customer who bought for more than 10 euro. Systeme U wishes to reduce the one way plastic bags by 10% on a yearly basis.

Conclusions

It is too early to draw conclusions on the French retailer's initiatives aiming at reducing plastic bags favoring more sustainable approaches. What we can say however is that all retailers focuses the plastic bags issue within the broader concept of sustainability, but not necessarily within an IPP concept. The IPP tools are used somehow but not in an integrated way. Carrefour made a LCA which will lead to policy decisions and some retailers are keen to have their plastic bags eco-labeled. Nevertheless, eco-labeling and LCA are not linked. Eco-design of plastic bags is not considered.

In relation to the French label NF environment, we can state that it constitutes excellent criteria for selecting improved bags. Nevertheless, this does not mean that the bags are more sustainable than the ones for which no NF environment was applied for (e.g.) for cost reasons. The NF environment criteria, even if based on life cycle analysis considerations, are only a small step towards sustainable products (from the 3 sustainable development pillars standpoint).

A special case: the referendum in Corsica on the replacement of one-way plastic bags

The French Retail Association (FCD) played an active role in the organization of the referendum, which took place on 23 and 24 May 2003 with the help of the Environment Office of Corsica and large retailers.

The year before, during the "festival du Vent Calvi", a campaign was launched against the one way plastic bags which led the Environment office of Corsica and the large retailers to start a discussion on this issue and decide on the organization of the referendum.



The latter took place in 6 hypermarkets and 2 supermarkets. Consumers were given the possibility to choose between three alternatives:

1. The reusable plastic bag sold at 1 euro and exchangeable free of charge
2. The Paper bag sold at 0, 08 euro
3. The bio-degradable bag sold between 0, 05 and 0, 14 euro according to the format

Results of the vote

- 30.448 persons voted:
 - 61 % in favor of the reusable plastic bag
 - 19,1% in favor of the paper bag
 - 13,5% in favor of the bio-degradable bag
 - 6,4% blank vote

The results of the vote meant that at the beginning of August 2003, one-way plastic bags had been replaced by reusable plastic bags and paper bags. As a consequence, the one-way plastic bags disappeared from the hypermarkets and supermarkets of Corsica.

D. Belgium

At the beginning of 2004, the Belgian government wished to introduce a tax on one way plastic bags. The Belgian Retail Association reacted by stating that there was no reason to discriminate single use plastic carrier bags because:

- They are « reused » as dustbin bags and later incinerated as household waste (which is not the case of paper bags, for instance) ;
- Their calorific value is much higher than fuel oils (46 mega joules against 44 for fuel oil) and their waste can therefore be interesting for recovery. Their high calorific power enables to save several millions of tons of petrol each year in France. Thus, the petrol used to make these bags becomes fuel for household waste with which they are collected and incinerated ;
- According to a German life cycle analysis (LCA) study and three Irish studies, plastic bags have a better LCA than paper bags (because less resources are necessary to produce them and they generate less waste) ;
- They require (11 times) less transport than paper bags because of their reduced weight ;
- Single use plastic bags have often become essential for hygiene reasons ;
- The Irish experience showed that the introduction of paper bags led to an increased « double bagging » phenomenon (a lot of consumers use two bags instead of one for solidity reasons) and thus to more waste.

The Belgian Retail Association is of the opinion that taking into account energy resources, the environment and consumer's comfort, it is not the plastic carrier bag which is polluting but rather the fact that it is thrown away in the nature by people



who are sometimes unconcerned about the environment. It is thus a question of consumer education for a "responsible use" of carrier bags.

Therefore, the Belgian Retail Association proposed to the public authorities a three-year plan with concrete measure to make the consumer aware of **a responsible use** of the one way plastic bags and of a **maximum use of (reusable)** alternatives. It entails a whole series of measures taking into account the specificities of each type of distribution channel. Each distributor must be allowed to adopt its own company policy and to take feasible measures for his company.

The Belgian Retail Association has also developed reliable amounted **objectives** concerning on the one hand the decrease in the "tonnage-single use carrier bags"/"turnover" ratio 20/25% and on the other hand the increased use of reusable and other alternatives (double this use) for the 2004-2006 period.

It should be highlighted that the retail sector in Belgium was already active in the reduction of plastic bags before the Belgian government came up with the idea of a plastax.

In the last three years food and non food retailers promoted reusable plastic bags through different awareness raising campaigns at shops. Some of them made their plastic bags payable; at other retail shops, the products were directly bagged by the cashiers to avoid misuse. Finally, some shops trained its staff to distribute one way plastic bags optimally.

Conclusions

The Belgian Retail Association is dealing with the reduction of plastic bags in a sustainable way based on the various studies and LCAs mentioned in the first part of the report. Embedding the solution of this problem within an IPP framework is not yet the main concern of the actors. There is no mention of an environmental label for plastic bags or of eco-design solutions for better use of plastic bags.

E. The UK

Faced with the litter issue, the **Scottish authorities** plan to go for tax on plastic bags like in Ireland.

A proposal for a bill was introduced in the Scottish Parliament in October 2003 placing a levy on specified plastic bags in Scotland. A consultation document released in February 2004 outlines the main ideas of the proposed legislation:

- The bill recommends a 10p levy on plastic bags
- Aims to legislate to encourage re-use of bags
- Proposes that local authorities will collect the levy from businesses via a submission of returns on the number of bags issued
- The money collected will be ring-fenced by the local authority for environmental projects including litter clear up and supporting community recycling project



The consultation on the levy has now closed, and is in the process of drawing conclusions from this before engaging with the Scottish Parliament's Non-Executive Bills unit to draft the Bill.

If it goes ahead, the Bill would potentially be introduced to the Parliament by the end of 2004, and depending on the priority attached to it and support it receives from other parties would take 1 – 2 years to become law.

The British Retail Consortium and the Scottish Retail Consortium are of the opinion that education rather than taxation is the most effective way to change consumer behavior in the use of one way plastic bags. Both organizations are involved in various initiatives and projects to increase consumer awareness of environmental issues, among others the Rethink Rubbish –National Waste Awareness Initiative (NWAI) teaming up with local authorities and retailers to educate consumers on waste related issues.

On this basis, large retailers in the UK are active in the field of litter and plastic bags.

Sainsbury's

Sainsbury's saw that carrier bags were becoming a key icon of waste and aimed to offer an approach allowing more means of diverting from landfill and the reuse of carrier bags than was currently available. Today, their stores currently offer:

- The Penny Back scheme, where if customers reuse a bag they receive a penny back or a penny is donated to charity.
- The offer of a Bag for Life at a cost of 10p.
- Recently introduction of a Supper Shopper (75p from larger stores) which is a shopping bag featuring the Rethink Rubbish logo.
- Larger stores now stock Smart Boxes (similar to plastic shopping baskets) that can be purchased & used in conjunction with special trolleys.
- Currently introducing biodegradable shopping bags.

Tesco

Tesco is rolling out degradable carrier bags to all its stores by mid 2004, including Scotland.

This decision has been taken as degradable bags are far less damaging to the environment:

- The heat generated by landfill will lead to complete disintegration of Tesco degradable bags within a few months.
- This is of added benefit to bags used as bin-liners as it allows the flow of air and water leading to more rapid biodegradation of the domestic or garden waste contained within.
- The carbon dioxide produced by this process is 24 times less damaging than methane produced by non-degradable bags.
- The sooner waste degrades, the less amount of space is required for landfill and the sooner landfill stabilises the sooner it can be used for other purposes.



Dixons Group

UK based carrier bag manufacturer Nelson Packaging Limited, has won the Best Environmental Initiative award by producing a new Varigauge Recycled carrier bag. The award was presented in London at the prestigious Plastic's Industry Awards on Friday 14th May.

The Dixons Group Plc became the first major retailer to introduce a "Prime Free" Varigauge carrier bag following an in depth analysis by the Group.

Nelson Packaging has branded their recycled bags "Prime Free" due to total exclusion of Virgin Polymer. The Company has been making carrier bags at its site for over 30 years and today is one of the largest producers in the UK. The Varigauge bag is an ideal Carrier bag for using recycled polythene as it is produced in a one piece construction with the handle area thicker to provide strength and quality. Capable of being printed in 12 colours using water based ink these bags are the first choice for many retailers whether they purchase millions or just a few boxes.

Boots

Boots issues around 500 million carry-out bags of various sizes and material types to our customers every year.

They have introduced initiatives to minimize the environmental impact of these bags, both with respect to the use of raw materials and the waste potentially created. We use notices at till points asking customers whether they need a bag; we have reduced bag thickness without compromising quality and performance; and we have reduced the range of sizes of bag available.

Marks & Spencer

In the summer of 2003, Marks & Spencer is trialing two approaches to reduce the amount of waste created by carrier bags. Working with Durham County Council in the North East of England, Marks & Spencer is trialing a range of durable shoppers and a more sustainable plastic carrier bag made from a material including corn-starch and vegetable oils. Whilst the re-usable shoppers provide customers with an opportunity to use fewer carrier bags, the corn-starch based bag is potentially renewable as well as being biodegradable. If successful we will look at introducing these bags to all our UK stores. We believe that this approach will have a greater environmental benefit for the than a plastic carrier bag tax which tends to move usage to paper bags which have a greater environmental 'footprint' than polythene equivalents.

Conclusions

The Scottish proposed tax on plastic bags is definitely not based on scientific studies but on political reasons –litter perception by the public. As for other countries, retailers are largely involved in consumer awareness about this issue and have self-regulated to a high degree. However, there is not on IPP vision on this matter as for the other countries. We have best practises and policies to reduce the use of one-way plastic bags but not integrated IPP approach to the subject. Nevertheless, it should be noted that retailers in the UK favours bio-degradable bags although not thoroughly proven better than the plastic bags.

III. GENERAL CONCLUSIONS

As already explained in the executive summary, the IPP integrated approach is far from being live. Nevertheless, there are clear trends towards using LCAs for taking policy decisions in a sustainable way like Carrefour did. Other retailers in France chose to use the plastic bags from an IPP perspective through the implementation of the French eco-label (NF environnement) on their plastic bags. But eco-design considerations in the production of sustainable plastic bags seem to be absent.

The three IPP tools are not used together and have not an impact on each other. This might be the result of a policy decision: a LCA is considered as sufficient in itself without necessarily having to lead to eco-labeling or eco-design considerations. But as the framework of IPP is not established and the IPP integrated approach not really fully understood, there are not yet in place policy decisions for an integrated approach of IPP tools in general which is reflected in the present report. Other IPP tools like EMS have not been considered at all in the manufacturing of the plastic bag.

The positive point is that retailers use the IPP tools on a voluntary basis adapting the tools to their own needs. IPP needs to be experimented in various ways and situations before entering any regulatory process. As we have seen, in some countries (like Belgium, France and Australia), the authorities favored voluntary approaches of the retail sector to resolve the litter problem of mainly the one way plastic bags. This approach could be successful but still needs an evaluation once all the measures have been implemented by the retail sector in the year to come. Nevertheless, we can say that the referendum in Corsica which led to a voluntary replacement of one way plastic bags by reusable bags has been a huge success and led to the full removal of one way plastic bags on that island.

The plastax in Ireland led to the elimination of the one way plastic bag but also to an increased use of paper bags which are less environmentally friendly than the one way plastic bags. Even though the tax helped to reduce the use of plastic bags, we are not sure that it is really better than voluntary approaches and that it led to an IPP approach of this particular product. Ireland did not make a proper LCA study and did not move to better eco-design practices or an environmental label.

Finally the last question that should be raised is: do we go for an IPP approach or for a sustainable product policy approach?

**ANNEX I: AUSTRALIAN RETAILERS ASSOCIATION CODE OF
PRACTICE FOR THE MANAGEMENT OF PLASTIC BAGS**
9 OCTOBER 2003

1. Group one objectives

Each Group One Code signatory (Includes the major and smaller supermarket chains and independent supermarkets sponsored by wholesalers or run under banner groups) agrees to work in partnership with governments, consumers, environmental groups and industry to:

- Commit to an audited 25 percent reduction in the annualized rate of lightweight HDPE plastic bags being issued by 31 December 2004;
- Target a 50 percent reduction in the annualized rate of lightweight HDPE plastic bags issued by 31 December 2005. An external audit will be conducted in July 2004 to assess progress to endeavour to strengthen the target to a commitment (based on the rate of reduction achieved);
- Target any further reduction in the annualized rate of lightweight HDPE plastic bags that may be achievable, subject to review of relevant operational factors such as take-up of multiple use bags by customers beyond 31 December 2005;
- Review in June 2005 the results of the 2004 targets and potential to achieve the 50 percent reduction by end-2005 with the aim to determine changes/options should it appear the targets will not be reached. Retailers will undertake this review with the assistance of the EPHC and ACCC if this is deemed to be required.
- Undertake the active development and implementation of viable and environmentally acceptable reusable options to support the above reductions;
- Support and promote initiatives designed to increase the current recycling rate for lightweight HDPE plastic bags to 15 percent of available bags (via in-store return only), or 30 percent of available bags through combined in-store and kerbside recycling, by 31 December 2005. These targets are based on figures adjusted to reflect the reduction in lightweight bags issued;
- Commit to the use of HDPE bags containing domestic recycled content and through recycling programs, maximize the recovery of quality feedstock for such bags.
- Investigate the development of viable degradable/reusable options, as appropriate, following consideration of the report on degradable bags by Environment Australia and the National Packaging Covenant Council;
- Work together to develop common standards for reusable bags and any redesign of packing frames needed to facilitate use and maintain productivity/efficiency. These objectives are to be pursued through the implementation by Group One retailers of a



range of initiatives and programs that present least risk to the health and safety of consumers and retail staff, and have the most favorable environmental impact. The number of lightweight HDPE bags issued in calendar 2002 is to be used as the base annualized rate, adjusted so that reduction targets reflect business growth. Group One signatories will provide this baseline data to the ARA, and define performance indicators along with comprehensive and transparent metrics, as part of the process of signing to the Code. The ARA then undertakes to provide aggregated figures to the National Packaging Covenant Council.

2. Code principles

This Code is guided by the principles of the National Packaging Covenant, the Waste Management Hierarchy and the package of measures endorsed by the EPHC on 23 December 2002. By signing this Code, retailers commit to implementing such of the initiatives as are practicable and achievable by each organization. Signatories to this Code will implement reduction initiatives individually or collectively with industry and recycling programs through an alliance with Clean Up Australia and the National Packaging Covenant Council. Code signatories that are also National Packaging Covenant participants will include strategies for applying the Code's initiatives in their Covenant action plans as appropriate. For Group One signatories, these programs seek to achieve a targeted reduction in the use of current lightweight HDPE plastic bags based on a phased approach over the next two and a half years, subject to monitoring and review of progress.

The following principles are the foundations of the Code, in accordance with the Waste Management Hierarchy;

Refuse – signatories will implement initiatives that encourage customers to minimize their acceptance of current lightweight HDPE bags;

Reduce – signatories will implement cost-effective initiatives to reduce the issuance of those current lightweight HDPE bags not already being recycled or reused;

Reuse – signatories will implement initiatives that encourage consumers to maximize the adoption of alternative plastic or other reusable bags;

Recycle – signatories will provide and promote in-store recycling systems where practicable, encourage the establishment of community and kerbside recycling schemes and support the use of Australian recycled-content bags. Additionally, signatories will;

Review and report on progress – each Group One signatory will monitor the progress of their own initiatives, based on a common audit process developed by a professional independent auditor, with the intention of improving procedures and practices. Signatories will report audited results half yearly to the National Packaging Covenant Council (NPCC) via the ARA. This report will track reduction in bag issue and increases in recycling. Achievements in litter reduction will be measured via Clean Up Australia and other agencies.

Review of the Code – after 18 months of implementation, the Code will be reviewed by a retail industry working group with the goal of achieving a continual improvement in the sustainable management and reduction of current lightweight HDPE bags. This Code covers the period 10 October 2003 to 31 December 2005.



3.Code initiatives

Signatories commit their best efforts to implementing, as is practicable and achievable by each organization (e.g. smaller retailers may not find it practicable or achievable to provide in-store recycling bins, etc), the following initiatives

Reducing bag use

- a) Provide and promote alternative/reusable bags, taking into account the environmental impacts of using alternatives; food safety requirements; occupational health and safety of staff; the physical limitations of customers; and public liability.
- b) Train checkout staff to build and maintain awareness of and support the promotion of alternatives, including to improve bag packing efficiencies to decrease the number of current lightweight HDPE bags issued; increase number of items packed per bag; and question the need for a bag where appropriate (e.g. in transactions of three items or fewer).
- c) Educate consumers about reducing the number of current lightweight HDPE bags used through encouraging the purchase and use of reusable alternatives.
- d) In conjunction with Environment Australia, Clean Up Australia and the National Packaging Covenant Council, implement community education campaigns that encourage behavioral change to:
 - Purchase and use reusable alternative bags;
 - Avoid using a bag for only a few items.
- e) Encourage packaging/filling/manufacturing companies to provide carrying devices on their larger packs to preclude the need for an outer carry bag.

Recycling

- a) Provide and promote use of recycling bins for return of clean used current lightweight HDPE bags.
- b) Train checkout staff to build and monitor awareness of and support increased recycling by customers.
- c) Develop initiatives with Shopping Centre owners, community groups and schools that encourage the recycling of current lightweight HDPE bags.
- d) In conjunction with Environment Australia, Clean Up Australia and the National Packaging Covenant Council, implement community education campaigns that encourage behavioral change to;
 - use in-store and kerbside recycling services;
 - avoid bags being sent to waste in landfill, either as direct disposal or after secondary use;
 - Correctly dispose of bags when used or re-used outside the home to prevent litter.



- e) Encourage development of the recycling industry by using bags with a percentage of recycled content derived from recycled bags.
- f) Strongly support and encourage the inclusion of current lightweight HDPE bags in kerbside recycling by local government.

Supporting Initiatives

- a) Encourage Group One and Group Two participation in the Code and in the National Packaging Covenant.
- b) Work with government, the bag manufacturing industry and research organisations to develop environmentally and commercially viable alternative bag options (including degradables if endorsed by Environment Australia) to current lightweight HDPE plastic bags.

4. Community Behavioral change Campaign

In conjunction with Clean Up Australia, Environment Australia, State Agencies and the National Packaging Covenant Council, the retail industry will develop and implement a continuing national community awareness campaign that will inspire and facilitate consumer and retailer action to:

- Refuse, reduce, reuse and recycle bags and raise consumer and retailer awareness of environmental impacts of bag use and associated waste management and recycling issues;
- The campaign would include advertising, direct marketing, public relations and internet marketing and publicity concerning the extension of recycling opportunities;
- The campaign will commence as soon as practicable and will run for the duration of the Code period, targeting the broader community as well as retailers, local councils, community groups and schools;
- The effectiveness of the campaign on community behavior and litter will be evaluated at regular intervals using consumer research organizations, focus groups, litter audits and disposal behavior observational methods.

5. Avoidance of negative impacts

The Code's initiatives will be implemented so as to:

- Limit or not add to costs related to store operational productivity/efficiency (through inappropriate alternative or secondary bag use);
- Minimize the risk of shoplifting and theft of trolleys and wire baskets;
- Not increase health and safety risks to staff and customers.



6. Definitions and clarifications

Bag - standard, single use, lightweight HDPE plastic bag designed for the general-purpose carriage of goods by consumers, excluding light plastic bags for the packing of perishable food and vegetables.

Initiatives - the initiatives mentioned in this Code will not contravene laws including those relating to Occupational Health and Safety and Food Safety.

Retailers - include supermarkets, department stores, convenience stores, take-away food outlets, chemists, newsagents, hardware stores, clothing and general stores. Other forms of retail trade such as community fetes, markets and stalls will also be encouraged to comply with relevant parts of the Code.

'Group 1' retailers - include the major and smaller supermarket chains and independent supermarkets sponsored by wholesalers or run under banner groups.

'Group 2' - all other retailers using lightweight HDPE bags.

Retailer commitment - the retailer endorses the objectives of the Code and agrees to pursue initiatives to meet these objectives as is practicable and achievable for their organization, and to report regularly as required under the Code. *Available bags* - there are approximately 7 billion¹ current lightweight HDPE bags issued annually in Australia. This number will change with reduction in issue and use as envisaged under this Code.

ANNEX II: COMMON FRAMEWORK FOR THE USE OF DEGRADABLE PLASTICS IN AUSTRALIA

At the December 11, 2003 meeting of the Plastics and Chemicals Industries Association (PACIA), in conjunction with the Federal Government Department of Environment and Heritage (DEH), the attendees agreed on a common framework for the use of degradable plastics in Australia.

It was recognized that a self-regulating market is preferable and that to achieve this, a number of elements need to apply to issues when they arose. The elements, in no particular order, are:

1. Continued application of the principle of Material Selection Based on Merit
2. Recognition and communication of the different and distinct degradation technologies and processes for degradable polymers
3. Recognition and communication that different disposal environments are needed for the breakdown of the various products made from these polymers
4. Development and application of Product Stewardship programs to ensure that:
 - Stakeholders (Supply Chain, Recovery Chain, Governments and Community/Consumers) are aware of the specific polymer types and degradation processes;
 - Stakeholders are aware of the disposal environments needed for the breakdown of the products made from specific degradable polymers;
 - The application of Total Life Cycle Assessments are taken into account for the selection and application of polymers.
5. Continued application of Risk Management principles, based on sound-science, to provide information and guide decision-making
6. Development and application of performance standards to products made from degradable polymers which:
 - are internationally consistent;
 - represent real life conditions.
7. The benefit and need for reliable information to the Supply Chain, Recovery Chain, Governments and Consumers.

Members also recognize the necessity and value of the following actions to assist the development and maintenance of self-regulating markets:

1. The sharing of relevant reports and studies
2. A co-operative approach to further research needed to clarify identified knowledge gaps
3. The development of a central library / database of relevant information relating to degradable polymers and products:
 - Assisted by web links from other associations and organizations
 - Assisted by appropriate search-engine linkages

ANNEX III: USEFUL LINKS

AUSTRALIA

1. Clean up Australia

<http://www.cleanup.com.au/Main.asp?RequestType=Doc&CatID=55&docID=53>

2. Australia: Department of the environment and heritage: plastic bags

<http://www.deh.gov.au/industry/waste/plastic-bags/>

3. Victorian litter Action Alliance

<http://www.litter.vic.gov.au/default.asp?casid=3205>

BERMUDA

Keep Bermuda beautiful

<http://www.kbb.bm/>

CANADA

Council of the Canadian Plastic Industry Association: Anti-litter resource website

<http://www.cpia.ca/anti-litter/main.php?ID=411>

GERMANY

Littering.de

<http://www.littering.de/>

IRELAND

Tidy towns

<http://www.tidytowns.ie/>

NEW ZEALAND

Green Bag New Zealand

<http://www.greenbag.co.nz/>

SOUTH AFRICA

plastic bags regulation

<http://www.elaw.org/resources/text.asp?id=1303>



UK

1. Carrier bags consortium (UK)

<http://www.carrierbagtax.com/>

2. Keep Britain tidy

<http://www.encams.org/home/home.asp>

3. UK : Auntie Litter

<http://www.auntielitter.org/>

USA

1. Reusables.com

<http://www.reusablebags.com/>

2.Keep America beautiful

<http://www.kab.org/>

GLOBAL

Plasticresource.com: information on plastics and the environment

http://www.plasticsresource.com/s_plasticsresource/index.asp

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4. Germany: Comparison of the effects on the environment from polyethylene and paper carrier bags, worked out by the German Federal Office for the Environment - 1990