



# Info Sheet

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Contact: Jennifer Killinger (703) 741-5833  
Email: [jennifer\\_killinger@americanchemistry.com](mailto:jennifer_killinger@americanchemistry.com)

## RECYCLABLE PLASTIC BAGS

### Plastic grocery bags are an extremely resource-efficient disposable bag choice.

- Plastic grocery bags require 70 percent less energy to manufacture than paper bags.<sup>1</sup>
- For every seven trucks needed to deliver paper bags, only one truck is needed for the same number of plastic bags, helping to save energy and reduce emissions.
- It takes 91% less energy to recycle a pound of plastic than it takes to recycle a pound of paper.<sup>2</sup>

### Less material means less waste and fewer emissions.

- 2,000 plastic bags weigh 30 lbs; 2,000 paper bags weigh 280 lbs. Plastic bags take up a lot less space in a landfill.<sup>2</sup>
- Plastic bags generate 80 percent less waste than paper bags.<sup>2</sup>
- Plastic grocery and retail bags make up a tiny fraction (less than 0.5 percent) of the U.S. municipal solid waste stream.<sup>3</sup>
- Plastic bags generate only 50% of the greenhouse gas (GHG) emissions of composted paper bags.<sup>1</sup>
- The production of plastic bags consumes less than 6 percent of the water needed to make paper bags.<sup>1</sup>

### Plastic grocery bags are fully recyclable<sup>4</sup> and the number of recycling programs is increasing daily.

- Nationwide over 830 million pounds of bags and film were recycled in 2007 – up 27 percent from 2005.<sup>5</sup>
- According to EPA's data, about 12 percent of plastic bags and film were recycled in 2007.<sup>3</sup>
- Plastic bags can be made into dozens of useful new products, such as building and construction products, low-maintenance fencing and decking, and of course, new bags.
- There is high demand for this material, and in most areas, demand exceeds the available supply because many consumers are not aware that collection programs are available at local stores.
- In recent years, many grocers and retailers have introduced plastic bag collection programs. Consumers should look for a collection bin, usually located at the front of the store. The number of municipal drop-off centers and curbside programs to recycle plastic bags is increasing also. Consumers can locate plastic bag recycling programs in their communities by visiting [www.PlasticBagRecycling.org](http://www.PlasticBagRecycling.org).
- In addition to grocery bags, other plastic retail bags, dry cleaning bags, newspaper bags, plastic wrap from products like paper towels and toilet paper, and all bags labeled with recycling codes #2 (HDPE) and #4 (LLDPE) can be included wherever plastic bags are collected for recycling.

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<sup>1</sup> Boustead Consulting & Associates Ltd. *Life Cycle Assessment for Three Types of Grocery Bags – Recyclable Plastic; Compostable, Biodegradable Plastic; and Recycled, Recyclable Paper*. 2007. See: [http://www.americanchemistry.com/s\\_plastics/doc.asp?CID=1106&DID=7212](http://www.americanchemistry.com/s_plastics/doc.asp?CID=1106&DID=7212)

<sup>2</sup> U.S. Environmental Protection Agency. *Questions about Your Community Shopping Bags: Paper or Plastic*. See: <http://web.archive.org/web/20060426235724/http://www.epa.gov/region1/communities/shopbags.html>

<sup>3</sup> U.S. Environmental Protection Agency. *Municipal Waste in the United States: 2007 Facts and Figures* (p. 52, Table 7). See: <http://www.epa.gov/osw/nonhaz/municipal/pubs/msw07-rpt.pdf>

<sup>4</sup> Recycling may not be available in all areas. Check to see if plastic bag recycling exists in your community. See: <http://www.plasticbagrecycling.org/01.0/>

<sup>5</sup> Moore Recycling Associates, Inc. *2007 National Post-Consumer Recycled Plastic Bag and Film Report*. Sonoma, California. 2009. See: [http://www.americanchemistry.com/s\\_plastics/sec\\_content.asp?CID=1593&DID=8899](http://www.americanchemistry.com/s_plastics/sec_content.asp?CID=1593&DID=8899)



**In addition to recycling, a recent national survey shows that over 90% of Americans reuse their plastic bags.**

- About 65% of Americans reuse their bags for trash disposal. Other common uses include lunch bags and pet pick-up.
- In this regard, the reuse of a plastic shopping bag prevents a second bag from being purchased to fulfill these necessary functions.

## WHAT TO KNOW ABOUT BAG BANS

**Banning recyclable plastic bags will not reduce society's dependence on oil.**

- In the United States, nearly 80% of polyethylene<sup>6</sup>, the type of plastic used to make plastic bags, is produced from natural gas, *not* oil. This includes feedstock, process and transportation energy.
- Much of the energy used to make plastic bags is embodied in the bag itself, and since plastic bags are fully recyclable, that energy is available for new products.

**Mandating that recyclable plastic bags be replaced with biodegradable or compostable bags will not reduce litter or the amount of waste in our landfills.**

- The biodegradable and compostable bags currently on the market will only degrade in a professionally-managed, large-scale composting facility. They will not breakdown in the natural environment, in a home composting device or in a landfill.
- It is currently estimated that there are fewer than 100 suitable composting facilities in the United States. Where composting facilities are not available, "compostable" bags will be sent to a landfill.

**Banning recyclable plastic bags or mandating their replacement with compostable bags will diminish efforts to recycle these products.**

- Mandating that grocers and retailers replace plastic bags with compostable or paper bags will eliminate many in-store collection programs, which are currently the largest mechanism for recovering post-consumer bags for recycling.
- In addition, the mandated use of compostable bags will cause the accidental commingling of biodegradable and recyclable bags, which will contaminate the recovered material, rendering it unusable by manufacturers.

**Last Updated: February 9, 2009**

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*The American Chemistry Council (ACC) represents the leading companies engaged in the business of chemistry. ACC members apply the science of chemistry to make innovative products and services that make people's lives better, healthier and safer. ACC is committed to improved environmental, health and safety performance through Responsible Care®, common sense advocacy designed to address major public policy issues, and health and environmental research and product testing. The business of chemistry is a \$664 billion enterprise and a key element of the nation's economy. It is one of the nation's largest exporters, accounting for ten cents out of every dollar in U.S. exports. Chemistry companies are among the largest investors in research and development. Safety and security have always been primary concerns of ACC members, and they have intensified their efforts, working closely with government agencies to improve security and to defend against any threat to the nation's critical infrastructure.*

<sup>6</sup> U.S. Department of Energy's and National Renewable Energy Laboratory's U.S. Life Cycle Inventory Database. See: <http://www.nrel.gov/lci/> Data also available as a report: Franklin Associates, LLC. *Cradle-to-Gate Life Cycle Inventory of Nine Plastic Resins and Two Polyurethane Precursors*. 2007. See: [http://www.americanchemistry.com/s\\_plastics/sec\\_content.asp?CID=1930&DID=7832](http://www.americanchemistry.com/s_plastics/sec_content.asp?CID=1930&DID=7832)





Council Member Bill "Kaipo" Asing, Chair  
 Council Member Jay Furfaro, Vice Chair  
 Council of the County of Kauai  
 Council Chambers  
 Lihue, Kauai

HEARING      Wednesday, September 09, 2009  
 9:15 am

**RE:    Bill No. 2321, Draft 1 - Relating to Plastic Bag Reduction**

Chair Asing, Vice Chair Furfaro and Members of the Kauai County Council

Retail Merchants of Hawaii (RMH) is a not-for-profit trade organization representing 200 members statewide and over 2,000 storefronts, and is committed to support the retail industry and business in general in Hawaii.

**RMH stands in strong opposition** to this proposal that restricts retail establishments that make available to customers convenient carry-out bags to providing only recyclable paper bags, biodegradable bags and reusable bags.

Hawaii's retailers unquestionably support initiatives to preserve and protect our environment. The solution to the plastic bag issue is not in a total ban, but in the **wise management** of this resource, i.e., the "**reduce, reuse and recycle**" principle. We absolutely support the broadest use of reusable tote bags as the ultimate solution, and have been proactive in providing these for our customers AND crediting consumers up to 5 cents per bag used at checkout. However, we do know that consumers' acceptance and use of these bags will not be universal or practical at all times.

One of the alternatives as proposed in this bill, namely recyclable paper bags, are up to ten times more expensive than plastic, in actual purchase price and in increased shipping costs to Hawaii. For every one truck that delivers plastic bags, seven trucks are needed to deliver the same number of paper bags; this volume measure is critical for ocean freight. Ultimately, these costs will be passed on to the consumer and will increase the COST of food and other products for Kauai's residents. Furthermore, paper in today's landfills does not degrade or break down at a substantially faster rate than plastic does because of lack of water, light, oxygen and other important elements that are necessary for the degradation process to be completed. Paper bags generate 70% more air and 50 times more water pollutants than plastic bags.

There are similar concerns with biodegradable plastic bags. They are considerably costlier than plastic and, according to the "Evaluation of the Environmental Impact of Carrefour Merchandise Bags" prepared by Price-Waterhouse-Coopers, and published in the ULS Report in June 2007, "biodegradable plastic bags generate higher levels of greenhouse gas emissions, atmospheric acidification and eutrophication (a process whereby bodies of water receive excess nutrients that stimulate excessive plant growth such as algae blooms)." The ULS Report is included with this testimony.)

We respectfully submit for your consideration a comprehensive recycling program: that requires retailers provide: 1) visible and accessible collection bins for recycling; 2) reusable bags for purchase and use in lieu of plastic; 3) education via recycling messages printed on recyclable bags; and 4) that the collected plastic bags are recycled.

Plastic bags provided by retailers today are recyclable, and are reused by consumers for everyday household tasks like lining waste baskets and sanitary cleaning up after pets. If these free bags are not available, consumers undoubtedly will purchase plastic bags for these uses.

Our retailers have been pro-active: placing recycling bins at stores; providing reusable bags for consumers; initiating educational messages, i.e., Knot the Bag. Larger retailers already ship the collected plastic bags to the mainland for recycling. Some retailers credit consumers up to 5 cents per reused or reusable bag and have reusable tote bags available for sale.

On March 22, 2008, eight Maui County retailers (Ah Fooks, Friendly Market, Haiku Grocery Store, Kualapuu Market, Misaki's Inc., Pine Isle Market, Pukalani Superette, and Wal-Mart) cooperatively sponsored "**Maui County Retailers Recycle.**" In one day, almost 2,000 reusable tote bags were given to customers in exchange for recyclable plastic bags; the bags collected filled a 45-foot shipping container. Wal-mart shipped the bags to the mainland for recycling. As an additional outreach, Wal-mart continues to assist Ah Fooks, Friendly Market, Haiku Grocery Store, Kualapuu Market, Pine Isle Market, and Pukalani Superette with their recycling efforts.

RMH is eager to work with Kauai County Council, Public Works Department, and Kauai's retailers to develop a partnership, particularly in the critical consumer education component. **Our mutual goals are to maximize the usage of reusable bags, to provide plastic bags to consumers for their personal, practical uses, and to recycle the excess bags, without over-burdening Kauai's residents.**

Thank you for your consideration and for the opportunity to comment on this measure.



Carol Pregill,  
President



## REVIEW OF LIFE CYCLE DATA RELATING TO DISPOSABLE, COMPOSTABLE, BIODEGRADABLE, AND REUSABLE GROCERY BAGS

### I. BACKGROUND

In March 2007, the Board of Supervisors of the City of San Francisco passed an ordinance effectively banning the use of plastic grocery bags at supermarkets and large pharmacies. The Board's objective was to stop environmental degradation and reduce litter, and its solution was to legislate the replacement of traditional plastic bags with reusable bags or bags made from paper or compostable plastic.

In an effort to gauge the impact of the Board's decision, both in terms of environmental impact and litter reduction, the Editors of *The ULS Report* have examined a number of credible third-party research reports, and used the findings to develop their own conclusions and recommendations.

### II. METHODOLOGY

An examination was made of three studies that compared the environmental impacts of various grocery bags, or provided data widely used to do so:

1. Carrefour Group, an international retail chain that was founded in France and is second only to Wal-Mart in terms of global retail revenues, commissioned a Life Cycle Assessment (LCA) Study by Price-Waterhouse-Coopers/EcoBalance (*Évaluation des impacts environnementaux des sacs de caisse, February 2004, #300940BE8*) that compared the environmental impact of four types of bags: plastic made from high density polyethylene (HDPE), paper, biodegradable plastic (50% corn starch and 50% polycaprolactone compostable plastic), and reusable plastic (flexible PE). The study evaluated environmental impacts from material production, through bag manufacturing and transport, to end of life management.

The study was completed according to ISO standards 14040-14043, and peer reviewed by the French environmental institute, ADEME, the Agency for Environment and Energy Management. The first review was by Henri Lecouls, an independent lifecycle analysis expert assisted by Laura Degallaix, representative of the Federal Consumers' Union, Que Choisir, and Dominique Royet, World Wildlife Federation (WWF) representative. A second review was made by related parties: APME (European Plastics Manufacturers Association; CEPI (Confederation of European Paper Industries); and Novamont, manufacturer of the biodegradable plastic assessed in the study.

2. *Life Cycle Inventories for Packagings*, Environmental Series No. 250/1, Swiss Agency for the Environment, Forests and Landscape (SAEFL), 1998. The study was critically reviewed by corporate and association members representing the paper, plastics, glass, aluminum and steel packaging industries.

3. *Eco-Profiles of the European Plastics Industry*, performed by I. Boustead for PlasticsEurope, 2005. This series was developed by LCA pioneer Boustead Consulting and conforms wherever possible to ISO standards 14040-14043. The data on polyethylene film are also referenced in the SAEFL study listed above.

Relevant data published by the U.S. Environmental Protection Agency (EPA) were also reviewed. This information was found on the EPA's website ([www.epa.gov](http://www.epa.gov)), and includes data from its well-known *Municipal Solid Waste in the United States* series.

### III. STUDY LIMITATIONS

1. Findings, conclusions, and recommendations are based on data that have been obtained through publicly available channels or through the broad group of contacts that *The ULS Report* has developed. There may be other data available that refute, confirm, or extend the findings herein developed.
2. Results are based upon an analysis of quantitative data, especially in relation to materials consumption, energy and water usage, pollution, and greenhouse gas (GHG) production. Because of their qualitative and personal nature, issues that transcend a scientific approach, such as the social value of renewable vs. non-renewable resources and composting vs. landfilling, are best considered independently by the reader.
3. Other than U.S. EPA data, the other studies originated in Europe and are based upon European manufacturing processes. Because production processes are relatively similar globally, the data provide accurate assessments between materials that can be used to draw valid conclusions in the United States.

### IV. FINDINGS

#### A. Biodegradation/Compostability

While paper and certain plastics may be biodegradable or compostable in specially designed industrial facilities, evidence indicates that this feature may be of little value in the effort to reduce waste:

1. According to the EPA, "Current research demonstrates that paper in today's landfills does not degrade or break down at a substantially faster rate than plastic does. In fact, nothing completely degrades in modern landfills due to the lack of water, light, oxygen, and other important elements that are necessary for the degradation process to be completed."<sup>1</sup>

As evidence of this, here is a photo of a newspaper buried in an Arizona landfill and dug up after more than three decades. As can be clearly seen, paper does not degrade rapidly in landfills. (Photo credit: Dr. William Rathje, Founder of The Garbage Project at The University of Arizona, and ULS Report Contributing Editor.)



Compostable plastics, which are produced from plant-based feedstocks, do not degrade in landfills, either. According to Natureworks®, a producer of a corn-based plastic known as PLA, containers made from its material will last as long in landfills as containers made from traditional plastics.<sup>2</sup>

2. In order to breakdown as intended, compostable plastics must be sent to an industrial or food composting facility, rather than to backyard piles or municipal composting centers. Since there are apparently fewer than 100 of these facilities functioning in the entire United States, the economic and environmental costs of wide-scale plastics composting are prohibitive, significantly reducing the value of such an alternative.<sup>3</sup>
3. By definition, composting and biodegradation release carbon dioxide (CO<sub>2</sub>), a greenhouse gas, into the atmosphere, increasing the potential for climate change. For example, composted paper produces approximately twice the CO<sub>2</sub> emissions produced by non-composted paper. (See Paragraph B.2. just below for specific details.)

#### **B. Waste, Energy Consumption, Greenhouse Gas Emissions**

The evidence does not support conventional wisdom that paper bags are a more environmentally sustainable alternative than plastic bags. While this is certainly counterintuitive for many people, relevant facts include the following:

1. Plastic bags generate 60% less greenhouse gas emissions than uncomposted paper bags, and 79% less greenhouse gas emissions than composted paper bags. The plastic bags generate 3,097 tons of CO<sub>2</sub> equivalents per 100 million bags; while uncomposted paper bags generate 7,621 tons, and composted paper bags generate 14,558 tons, per 100 million bags produced.<sup>4</sup>
2. Plastic bags consume less than 4% of the water needed to make paper bags. It takes 5,527 cubic meters of water to produce 100 million plastic bags, versus 145,729 cubic meters of water to produce 100 million paper bags.<sup>5</sup>
3. Plastic grocery bags consume 40% less energy during production and generate 80% less solid waste than paper bags.<sup>6</sup> Significantly, even though traditional disposable plastic bags are produced from fossil fuels, the total non-renewable energy consumed during their lifecycle is no greater than the non-renewable energy consumed during the lifecycle of paper and biodegradable plastic bags.<sup>7</sup>
4. Paper sacks generate 70 percent more air, and 50 times more water pollutants, than plastic bags.<sup>8</sup>
5. It takes 91 percent less energy to recycle a pound of plastic than it takes to recycle a pound of paper.<sup>9</sup>
6. After three uses, reusable plastic bags are superior to all types of disposable bags --paper, polyethylene and compostable plastic -- across all significant environmental indicators.<sup>10</sup>

### C. Litter

While the data appear to indicate that paper and compostable plastic bags may account for less litter, data also indicates that this finding is offset by the increased environmental impacts these bags produce versus traditional plastic bags:

1. The manufacture of paper bags consumes three times more water and emits about 80% more greenhouse gases than the production of plastic bags.<sup>11</sup>
2. Compared to disposable plastic bags, biodegradable plastic bags generate higher levels of greenhouse gas emissions, atmospheric acidification and eutrophication (a process whereby bodies of water receive excess nutrients that stimulate excessive plant growth, such as algae blooms).<sup>12</sup>

### V. CONCLUSIONS/INDICATED ACTIONS

The conclusion to be drawn about how to reduce the environmental impacts and litter associated with grocery bags is very much in line with both longstanding EPA guidelines and the ULS Report philosophy: the issue is not paper or plastic, but rather finding ways to reduce, reuse, and recycle both of them - *in that order*. By putting more items in fewer bags, avoiding double bagging, switching to durable tote bags, and reusing and recycling disposable bags, significant reductions in material and non-renewable energy consumption, pollution, solid waste, greenhouse gas emissions, and litter, will occur.

And, while recycling can help save resources, its real value lies in the reduction of greenhouse gas emissions, and the minimization of waste going to landfills. Also, recycling helps reduce litter, as bags are contained and stored. Containment reduces the potential for them to be left in open spaces, where they become eyesores.

### VI. SUMMARY

Legislation designed to reduce environmental impacts and litter by outlawing grocery bags based on the material from which they are produced will not deliver the intended results. While some litter reduction might take place, it would be outweighed by the disadvantages that would subsequently occur (increased solid waste and greenhouse gas emissions). Ironically, reducing the use of traditional plastic bags would not even reduce the reliance on fossil fuels, as paper and biodegradable plastic bags consume just as much non-renewable energy during their full lifecycle.

Further, an Internet scan of available government and non-profit information for the United States, United Kingdom, Canada and Australia indicates that chewing gum and cigarette butts account for up to 95% of the litter generated in the English-speaking world.<sup>13</sup> Thus, there would appear to be far better and potentially more effective legislative opportunities available if the objective is to significantly reduce litter.

Again, when it comes to reducing the environmental and litter impacts of grocery and merchandise bags, the solution lies in a.) minimizing the materials used to produce all types of bags, regardless of their composition, and b.) building public awareness and motivation to reduce, reuse and recycle these bags - in that order.



Robert Lilienfeld, Editor

### Footnotes

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<sup>1</sup> U.S. Environmental Protection Agency (EPA) website, *Questions About Your Community: Shopping Bags: Paper or Plastic or... ?* ([www.epa.gov/region1/communities/shopbags.html](http://www.epa.gov/region1/communities/shopbags.html)).

<sup>2</sup> *Corn Plastic to the Rescue*, by Elizabeth Royte, *Smithsonian*, August, 2006 ([www.smithsonianmag.com/issues/2006/august/pla.php?page=1](http://www.smithsonianmag.com/issues/2006/august/pla.php?page=1)).

<sup>3</sup> These figures were provided by a number of experts, but due to the fluctuating dynamics of the composting industry, no firm citation can be given. One article that mentioned the relative unavailability of industrial and food composting was *Composting that Plastic* by Eliza Barclay, *Metropolis Magazine*, March 1, 2004 ([www.metropolismag.com/cda/story.php?artid=153](http://www.metropolismag.com/cda/story.php?artid=153)). See also the *BioCycle* site [www.findacomposter.com](http://www.findacomposter.com).

<sup>4</sup> *Life Cycle Inventories for Packagings*, Volume 1, SAEFL, 1998, Environmental Series 250/I and *Eco-Profiles of the European Plastics Industry*, developed by I. Boustead for PlasticsEurope, March, 2005 ([www.plasticseurope.org/content/Default.asp?PageID=404&IsNewWindow=True](http://www.plasticseurope.org/content/Default.asp?PageID=404&IsNewWindow=True)).

<sup>5</sup> *Ibid.*

<sup>6</sup> U.S. EPA website, ([www.epa.gov/region1/communities/shopbags.html](http://www.epa.gov/region1/communities/shopbags.html)).

<sup>7</sup> *Évaluation des impacts environnementaux des sacs de caisse Carrefour* (Evaluation of the Environmental Impact of Carrefour Merchandise Bags), prepared by Price- Waterhouse-Coopers/Ecobilan (EcoBalance), February 2004, #300940BE8. ([www.ademe.fr/htdocs/actualite/rapport\\_carrefour\\_post\\_revue\\_critique\\_v4.pdf](http://www.ademe.fr/htdocs/actualite/rapport_carrefour_post_revue_critique_v4.pdf)).

<sup>8</sup> U.S. EPA website, ([www.epa.gov/region1/communities/shopbags.html](http://www.epa.gov/region1/communities/shopbags.html)).

<sup>9</sup> U.S. EPA website, ([www.epa.gov/region1/communities/shopbags.html](http://www.epa.gov/region1/communities/shopbags.html)).

<sup>10</sup> *Évaluation des impacts environnementaux des sacs de caisse Carrefour. Op cit.*

<sup>11</sup> *Ibid.*

<sup>12</sup> *Ibid.*

<sup>13</sup> See *Litter Composition Survey of England*, October 2004, produced by ENCAMS for INCPEN ([www.incpen.org/pages/userdata/incp/LitterCompSurvey24Jan2005.pdf](http://www.incpen.org/pages/userdata/incp/LitterCompSurvey24Jan2005.pdf)). Also see *Facts About Litter* from an Australian governmental site ([www.environment.nsw.gov.au/litter/factsaboutlitter.htm](http://www.environment.nsw.gov.au/litter/factsaboutlitter.htm)), and equivalent government and non-profit sites in Canada and the United States, such as [Keep America Beautiful](http://www.KeepAmericaBeautiful.org).

