ENVIS

Management of Plastics, Polymer Wastes and Bio-polymers and Impact of Plastics on the Eco-system

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Indian Centre for Plastics in the Environment

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Plastic Bags generate 60–79% less greenhouse emission than paper bags

Reveals Review of Life Cycle Data Relating to Disposable, Compostable, Biodegradable and Reusable Grocery Bags

ULS Report

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

Research Reveals the Ironies in Plastic Bag Bans

Data Shows that Bans on Plastic Bags May Cause More Harm than Good

(June 7, 2007 – Rochester, MI) A review of highly credible, third-party research has revealed that banning traditional plastic bags from retail stores will probably not produce the intended results, and in the case of greenhouse gas generation, may actually harm the environment. Conducted by *The ULS Report,* the study was done after the city of San Francisco banned plastic bags in an effort to reduce environmental impacts and litter. Other communities around the country are considering similar bans.

The research, which was in large part commissioned and/or reviewed and published by the U.S. EPA and its French and Swiss governmental counterparts, points out a number of rather ironical facts:

- Although they are made from natural gas or oil, plastic bags actually consume less fossil fuels during their lifetime than do compostable plastic and paper bags. (The reasons are that compostable plastic bags use far more material than do traditional plastic bags, and it takes significant fossil fuel energy to convert trees into paper.)
- Plastic bags generate 60% less greenhouse gas emissions than do paper bags. And because composting creates carbon dioxide, a greenhouse gas, the plastic sacks generate 79% fewer greenhouse gas emissions than do paper bags after the latter are composted!
- The best environmental choice is a reusable bag, as long as you actually reuse (or recycle) it.
- Cigarette butts, chewing gum, and candy wrappers account for about 97% of all litter. Paper and plastic bags are generally a very small part of the total.

These findings are a proverbial whack on the side of the head. While counterintuitive, they do indicate that bans on specific materials aren't likely to either help the environment or significantly reduce litter.

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), 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 breakdown 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.'[1]

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.[2]

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.[3]
3. By definition, composting and biodegradation release carbon dioxide (CO_2), a greenhouse gas, into the atmosphere, increasing the potential for climate change. For example, composted paper produces approximately twice the CO_2 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_2 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.[4]
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.[5]
3. Plastic grocery bags consume 40% less energy during production and generate 80% less solid waste than paper bags.[6] 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.[7]
4. Paper sacks generate 70 percent more air, and 50 times more water pollutants, than plastic bags.[8]
5. It takes 91 percent less energy to recycle a pound of plastic than it takes to recycle a pound of paper.[9]
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.[10]

C. Litter

While the data appears 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.[11]

2. Compared to disposable plastic bags, biodegradable plastic bags generate higher levels of greenhouse gas emissions, atmospheric acidification and eutro-phification (a process whereby bodies of water receive excess nutrients that stimulate excessive plant growth, such as algae blooms).[12]

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 nonrenewable 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.[13] 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.

Footnotes

1 U.S. Environmental Protection Agency (EPA) website, *Questions About Your Community: Shopping Bags: Paper or Plastic or…?* (www.epa.gov/region1/communitiesshopbags.html).

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

3 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).
See also the BioCycle site www.findacomposter.com.

4 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& IsNew Window=True).

5 Ibid.

6 U.S. EPA website, (www.epa.gov/region1/communities/shopbags.html).

7 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/actualiterapport_carrefour_post_revue_critique_v4.pdf).

8 U.S. EPA website, (www.epa.gov/region1/communities/shopbags.html).

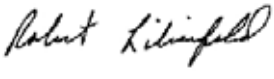
9 U.S. EPA website, (www.epa.gov/region1/communities/shopbags.html).

10 Évaluation des impacts enviro-nnementaux des sacs de caisse Carrefour. *Op cit.*

11 Ibid.

12 Ibid.

13 See *Litter Composition Survey of England,* October 2004, produced by ENCAMS for INCPEN (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), and equivalent government and non-profit sites in Canada and the United States, such as Keep America Beautiful.



Robert Lilienfeld,
Editor

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identiPlast

The Biennial International Conference on the Recycling and Recovery of Plastics
Brussels, Belgium – 23-24 April, 2007

The International Conference Signals Positive Outlook for Plastics Recycling and Recovery

Reflecting growing market demand for sustainable waste solutions, the sixth IdentiPlast conference – the plastics industry's most important gathering on recycling and recovery of plastics – attracted a record number of participants from around the world. More than 260 delegates, including 25 Chinese representatives, attended the Brussels event, held from 23-24 April, representing the entire plastics value chain.

"We should not be afraid to talk publicly about our role in relation to climate protection. Plastics have a positive impact on resources, dramatically extending the life-span of the raw materials used and through recycling,"

The sessions at IdentiPlast focussed strongly on new opportunities for the plastics industry to help protect the environment and use resources more efficiently.

This year's Best Presentation Award was given to Vijay Merchant of Indian Plastics Association, Plastindia, for his demonstration of how plastics waste is re-used for road construction in India.

(Excerpts from press release by PlasticsEurope)

IdentiPlast 2007: Mr. Vijay Merchant receiving the Best Presentation Award from President of Jury.

Presentation by Mr. Vijay Merchant

Opening Remarks:

At the outset, on behalf of Indian Centre for Plastics in the Environment - ICPE and the Indian plastics industry, I wish to thank the organizers of IdentiPlast 2007 for inviting me to present a paper on the unique recycling and reuse experiment of using Dirty Plastic Film Waste for purpose of road construction.

This Indian project initiated by the plastics industry initially gathered steam due to extremely harsh threats by the Chief Minister of banning polybags in a southern state in India. Tamil Nadu State is the size of a large European country. Dirty Plastic Film Waste had become a serious nuisance in cities, it was along water fronts, street corners, etc., in tons and the pollution control board had drafted a ban order for finalization which would have had serious consequences for almost 65 million citizens of the state. Similar bans were being considered in other states. A committed professor from Thiagrajar College in Madurai working with the plastic industry volunteers helped make this project possible.

Use of Dirty Comingled Plastic Waste in Road Construction in India-

Creating Value- Challenges & New Opportunities with Indigenous Technology

Vijay Merchant, Member-GC,ICPE

A small step towards...

Specialties

- Better Roads - longer life
- Use of Waste Plastics
- Saving of Bitumen
- Costs Less
- Job for Self Help Groups

Plastic Tar Road -A New Path way

How this Project was Concieved?

- Threats of Bans on Polybags in South India- Tamil Nadu – Dirty polybag waste eyesore- Landfills full up
- Realistic Situation –
  Raw Materials are Scarce in India
  Economies of Asia - Similar old disposal habits
  Cost & Price Driven Responses Can Survive
- We firmly believe –
  Waste is only a Resource in the Wrong Place !

The Process

- Method I (Wet Process)
  - Blending of waste plastics by direct mixing of shredded polymer with hot bitumen at 160 °C
  - Mixing of higher percentage of polymer difficult because of difference in viscosities of molten polymer and bitumen.
  - Powerful mechanical stirrer required for effective mixing.
  - Also required addition of stabilizers and proper cooling.

Dr. Vasudevan's Idea

- Method II – Dry Process

  Waste polymer is added on the hot aggregate(170 °C)

  The polymer gets coated over the aggregate uniformly.

  Then bitumen is added; mixing of bitumen with polymer takes place at the surface of the aggregate around 155-163 °C.

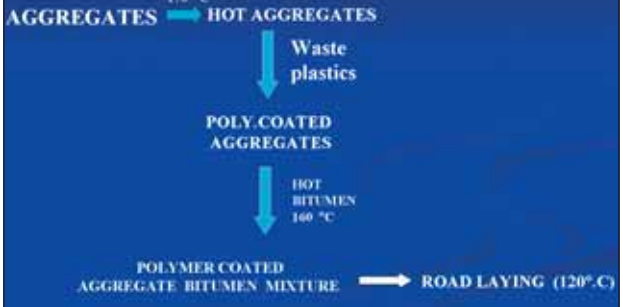
  With the increase in surface area of contact, mixing of polymer with bitumen is better.
  Hence, blend with better binding property is formed.

Economies of Most Asian Countries

- Average daily earning of poorest is $2 (Rupees 80/-)
- Reward for daily collection of dirty plastic waste
  a) 20kgs- Rs.200/- = $5
  b) 30kgs- Rs.300/- = $7.50
- Using plastic waste for blending with bitumen (due to affordable cost of collection) attractive economically & practical.

Process Outline

WASTE PLASTICS COATED AGGREGATE- BITUMEN MIX




Plastics waste – Cleaning process


Waste Plastics
mixed with the
hot aggregate


Shredding
Required size
waste

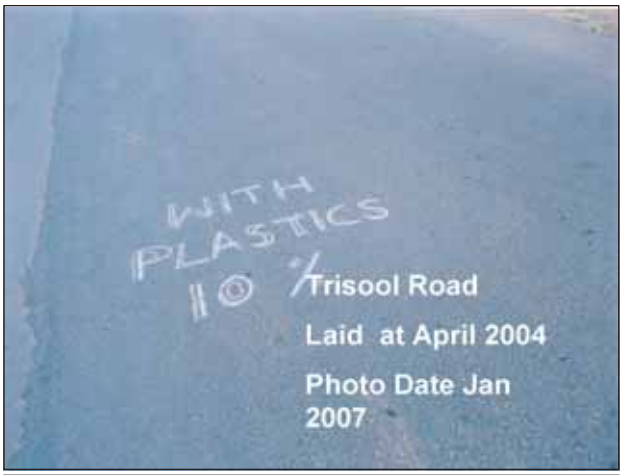

Coated Aggregate
Plain Aggregate

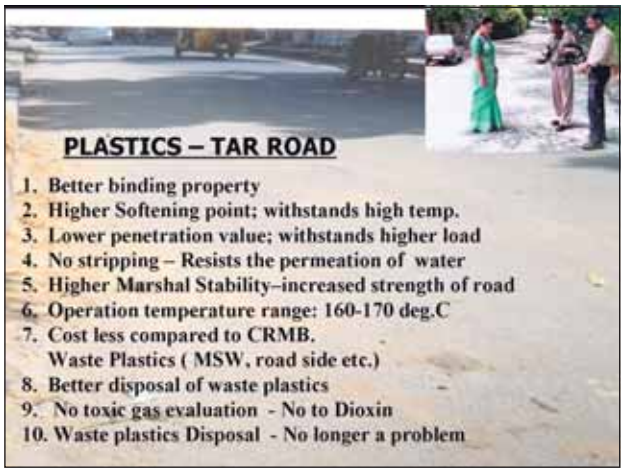

Mini Hot Mix Plant
Aggregate heated To 170°C


Bitumen added


Aggregate Transferred to
puddling chamber


Aggregate-plastics-bitumen mix





Coating Over Stone Improves Quality
Void Characteristics

Stone Aggregate	Percentage of Plastic	Moisture Absorption	Soundness	Voids
Without plastic coating	0	4%	–5	4%
With plastic coating	1%	2%	Nil	2.2%
	2%	1.1%	Nil	1%
	3%	traces	Nil	Nil

Plastic Tar Road Cheap and Good

Products	Area	Bitumen needed	Plastics needed	Bitumen saved	Cost reduced
Road	1kmX 3.75 m	9 tonnes	1 tonnes	1 tonnes	Rs.15,000
Block	1kmX 3.75	NIL	40 tons	NIL	20%
Roofing Sheets	1m X 1m	NIL	250gms	100%	To evaluated

Bitumen Coating over plastic coated aggregate

RESISTANCE TO STRIPPING

Aggregate Coated with plain Bitumen

Shows 5% stripping after 24 hours

- Aggregates coated with Plastics Waste followed by bitumen Shows Nil Stripping even after 72 hours

No Pot Hole Formation

MIX MODIFIER

% of Bitumen	% of Polymer With respect to bitumen	Marshall Value Kg
4.6	0	1150
4.6	5	2010
4.6	10	2540
4.6	15	2440
4.6	20	2300
5.0	15	2670
5.0	20	2040
5.5	20	1830

Roads Scene in India

- India today worlds largest market for Road Construction.
- 3.3 mill. km. roads but 80% /90% very poor surface- most roads need surfacing
- Road building is largest infrastructure investment project –today $14 billion needed
- Imports of 25000 tons bitumen annually.

Industry's Initiatives

- Industry Sponsors Trial Road Making
  - Procures Testing Equipment
  - Initiates dialogues with Commissioners in Cities
- Attracts Ragpickers /waste collectors with offers
- Involvement of Academicians & Technical Experts in planning, teaching & execution - laying trials

Special Aspects of Project-

- Simple process,needs no new machinery
- Helps saves cost of bitumen
- Improves performance of roads
- Solves problem of plastic waste disposal
- Practical Experience of our Industry

Introducing the Change & Resistance- Authorities, Contractors, Politicians , Citizens

How this plan has progressed

- Different processes tried out of blending waste with bitumen, coating hot aggregate
- Different Tests being worked out- Standards being determined to give details of tests
- Conditions monitored since last 4 years

roads laid - Local Bodies involvement- people's response encouraging

Future Prospects in Asian countries encouraging

- India's initiative in waste utilization for roads novel- Better than disposing it by burning dirty waste
- Offer to other Asian countries now made -

Come & see actual road laying with waste

- Advice of experienced technical professionals trained in India in this project now easily available

Completed road after 7 days- Mumbai

A complete article on **Use of Plastics Waste in the Construction of Tar Road** published in the Envis, April 2004 and Jan.-Mar. 2005 issues, describes ICPE trial on a Mumbai Road.

China-India Plastics Industry Summit 2007

A Report by
Mr. Arvind Mehta
President, Plastindia Foundation

Mr. Arvind Mehta making presentation at the Summit.

The first ever summit of the Chinese and Indian Plastic Industries was organized by Plastindia Foundation and China Plastic Processing Industry Association (CPPIA) and Adsale Exhibition Services at Guangzhou, on 20th May, 2007 with the backing of both the governments of China and India under the able leadership of Minister of State for Chemicals and Fertilizers and Parliamentary Affairs, Mr. B. K. Handique and Mr. B. P. Pandey, Jt. Secretary, Department of Chemicals and Fertilizers and Mr. Chen Shineng, President, China National Light Industry Council. Full teams from CPPIA and Plastindia were present.

Observations and some Comparisons of India China Plastic Industry Growth Path during Summit visit are given here:

PLASTICS – SOME COMPARISONS

	CHINA	INDIA
Vision	To be a global manufacturer and make China a world leader in plastics.	In the process of attaining global status.
Industry Desire	To become the hub of plastic products.	Focusing on making India a sourcing hub.
Policy Implementation	The political party members frame policies and see that Government implements these policies. In short party decides & Government implements.	The Government is now acting and the subject about awareness of plastic is now being focused with the advent of New Petrochemical Policy.
Composite Taxes	17% VAT. From the very first day VAT is chargeable. It becomes compulsory to pay VAT.	16% Excise Duty + 4% VAT = a total of 20% which is refundable. Many States charge 12.5% VAT on the same products and many cities charge octroi which is added burden.
Cluster Approach	After receipt of Export Orders, machinery/raw material co-ordination is there and cluster approach is maintained.	Not so

PLASTICS – SOME COMPARISONS

	CHINA	INDIA
Finance	Available more easily as backed by Province, State Govt., etc.	Available now but with tough conditions and good amount of processing time.
Interest Lending Rate	9% maximum	Between 11% - 14%
FD Interest Rate	2.5%	9% to 15%
Power	Rs.4/- average rate per unit	Rs.4/- fixed rate per unit
Labour Cost	In the slab of Rs.7000/- - Rs.10000/-	In the slab of Rs.5000/- - Rs. 8000/-
Labour Productivity	2 : 1	
Purchasing Land & Bldg	Now all have to pay for the land & the building (Earlier all Government finance support was available and no cost was incurred).	Build with individual funds.
Central Government	Very supportive	O.K.
State Government	Very supportive	O.K.
Province	Very supportive	O.K.
Trade Unions	Supports productivity	Not always
Work Discipline	Very good	O.K.
Working Hours	24 hrs.x 7 days a week	24 hrs. x 5 days a week
Scale	Now considered big out of 60,000 mfg. units, 12,600 units are large and rest small.	Still on a lower scale out of 50,000 units 250 units are limited companies, i.e., big in size, the rest are small now getting restructured.
Management	O.K.	Better managers
Environment & Government	Plastics is recognized as an energy saver.	Not recognized
	Plastics is used in agriculture to enhance productivity.	Not recognized
	Plastics are used in modern technological industries and it is recognized and supported.	It is recognized but not supported as plastic product.
Per Capita Consumption of Polymer	30 kgs	5 kgs
Polymer Consumption	Prime 38.00 million tons + Reprocess 6.60 "From Imported Scrap" Total 44.60 million tons Plus (Local generated scrap extra)	Prime 5.00 million tons + 1.30 Local Scrap reprocessed Total 6.30 million tons
Brands	No priority	Brand a priority
Human Resources	There is co-ordination of all Technical Institutes. They develop manpower as required by Industry.	CIPET & Engineering Colleges provide with Polymer Course, but there is shortage.

(Contd. on page 12)

(Contd. from page 11)

PLASTICS – SOME COMPARISONS

	CHINA	INDIA
Cost advantages of China pertaining to	Labour Power Land Building	Now nearly same as China
Raw Materials	US$10/- to US$50/- per metric ton cheaper in China as they are bulk buyers of polymers	Not so in India
Plastic Products	Cost is cheap but relatively high percentage of reprocessed material is used. China is the 2nd largest product manufacturer in the world.	Cost is high because of low productivity scale, and irrational input taxes.
Exports	US$20 billions of plastic Products with growth of 22%.	US$2.5 billions of plastic Products including raw material
Polymers	Deficit of 17 million tons per year.	No deficit, but at the same time neither any surplus.
PVC Resin	About 100 carbide-based plants, processing and consuming high power.	Only one carbide plant in existence.
Crude Oil	Imports 40%, while 60% is locally manufactured.	Imports 70%, while only 30% is manufactured locally.
Plastics Scrap	Around 6.6 million tons is imported.	Insignificant imports.
Intellectual Property Rights (IPR)	Violations are there.	Violations are very less.
What to buy	From China, Machinery duly translated technology of advanced countries which is cost-effective.	From India Electronic Controllers, Software & Design
What to Sell	To China Specialised Machinery.	From India, may be electronic controllers, software
Win Win	Joint venture with India	Joint venture for cost reduction.
Dies & Mould	We may buy from China due to low cost	We can sell moulds of automobile parts & houseware, etc.

Plastics – A Source of Energy

Material recovery is by no means the only way to recycle plastics. Another option is to recover their thermal content, providing an alternative source of energy. An average typical value for polymers found commonly in household waste is 38 mega joules per kilogram (MJ/kg), which compares favourably to the equivalent value of 31 MJ/kg for coal. This represents a valuable resource, raising the overall calorific value of domestic waste which can then be recovered through controlled combustion and re-used in the form of heat and steam to power electricity generators. Successful ventures in this field include plants, such as a major incinerator in Edmonton, North London, which produces steam to power an electricity turbine. The electricity is then sold to the Eastern Electricity Board. Waste containing plastics can also be reprocessed to yield fuel pellets, which have the added advantage of being storeable.

Source: British Plastics Federation
www.bpf.co.uk

Workshop on Plastic Waste Management

School Programme

Vidya Vikas Education Society's College of Arts, Science & Commerce, Vikhroli, Mumbai, organised a National Environment Awareness Campaign on the theme **Solid Waste Management – Plastic Waste Management** on 3rd April, 2007.

The programme was organised in conjunction with BAIF Development Research Foundation, Pune and sponsored by the Ministry of Environment and Forests, Govt. of India.

ICPE conducted a Workshop for students on Plastic Waste Management.

This Workshop attracted keen interest and attention of the students, teaching faculty and invited members of the local residents. Through display of panels and by exhibiting samples of non-critical products of daily use manufactured from recycled plastics, a clear message was spread among the students and other participants about the importance and usefulness of proper plastics waste management.

The College management and the general public alike expressed deep satisfaction about such kind of awareness programme.

Mr. Rajiv Tolat, Hon. Treasurer, ICPE, addressing the participants.

Section of Participants

Display of Panels and Recycled Products

www.envis-icpe.com

Website hits for April-June 2007

Months		Hits
April	:	47,689
May	:	46,831
June	:	49,716

Now, power your house from plastic waste

Electricity from Plastic Waste. It may sound unrealistic, but it's now being touted as the technology of future for the power-deficit India. Mrs. Alka Umesh Zadgaonkar, who has got six patents in India for the technology and in the process of filing for international patent, is joining hands with two large corporates to make it a commercial success.

Mumbai-based Asian Electronics (AEL) and Singapore's Enviro-Hub Holdings have teamed up to build four power plants of 8 mega watt (MW) each based on this 'commercially viable' technology. The plants will be fired by the liquid hydrocarbon produced from plastic waste.

The new initiative will take shape through the projects of the joint venture company – Green Hydrocarbons (GHL) which is registered in Japan, Europe and the U.S.

The power plants will be set up in Navi Mumbai, Bhiwandi, Thane and Rajasthan at a total capital expense of Rs. 128 crore. On experimental basis, AEL had set up a 2 MW plant in Nagpur, which is running in full steam, according to a senior AEL official.

(Source: The Economic Times, Mumbai)

ICPE – Envis Newsletter issue Aug.-Dec. 2004 had published details of the basic invention of Fuel from Plastics Waste by Prof. Alka Umesh Zadgaonkar.

Plastics Recycling Facility at Kolkata

Inauguration ceremony on 5th June, 2007 was co-sponsored by ICPE

The Centre for Quality Management Systems (CQMS) – Jadavpur University in association with Paschim Banga Bigyan Mancha and other NGOs and Plastics Associations with active support of local civic authorities installed a Plastics Recycling Facility at Kolkata.

In the recent past, there have been considerable debates on the issue of thin plastics carry bags and the solid waste management problem created by such bags. While the Government Authorities have taken appropriate measures to limit the availability of such thin carry bags by restricting their thickness and size, it was unanimously agreed by all concerned that the solution lies in creating proper awareness among the general mass on their littering habits and to adopt proper waste management practices.

ICPE has associated itself with CQMS – Jadavpur University and Indian Plastics Federation – IPF; in the Anti Litter Campaign in the city of Kolkata and in developing the door-to-door collection of plastics waste in Ward No. 82.

CQMS has developed a system, which ensures neutralizing any untoward obnoxious gaseous emission during an improper plastics recycling process mainly in the unorganized sector. CQMS may also evaluate the effectiveness of such a system in other chemical / recycling processes. ICPE hopes that CQMS has made adequate arrangement of safe disposal of the liquid chemicals, which dissolve the gases during recycling process.

In this respect ICPE also suggests that proper awareness and training may be imparted to the plastics recyclers for adopting correct recycling practices by using well ventilated rooms for installing properly designed machines and using appropriate stabilizer system and correct temperature profile to arrest emission of any unwanted gaseous emission in the first place.

ICPE together with Plastics Industry and Plastics Associations would be ready to join the local Institutes and KMC in creating such awareness and create a safe and healthy environment in our surroundings.

> The authorities in Kolkata Municipal Corporation had enquired about the experimental Dry Waste Management Programme initiated by ICPE in selected Mumbai Wards in association with NGOs and with active support of Mumbai Municipal Corporation.
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> The information has since been provided to IPF and CQMS for forwarding to KMC.
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> ICPE would share more details of the success story of effective Dry Waste Management and subsequent recycling of the dry waste.

Recycling Instead of Banning

International News

Arkansas' legislature is taking a different approach to polystyrene foam litter problems. Instead of banning the material, like some communities in California, it's looking at recycling it

LITTLE ROCK - A House Committee recently endorsed legislation that would direct the state's environmental agency to develop regulations for recycling Styrofoam, the plastic foam used to make cups and packaging material.

Under House Bill 1465, regulations developed by the State Pollution Control and Ecology Commission after public input then be used by landfill operators and recycling centers to recycle Styrofoam from homes and businesses.

The bill by Rep. Kathy Webb, D-Little Rock, advanced from the House City, County and Local Affairs Committee on an 11-3 vote. It goes to the House.

"Styrofoam has a life expectancy much longer than us, up to 500 years, and over time will comprise over 30 percent of a landfill," she said, speaking to the committee on the importance of recycling the plastic foam. "This is a good bill. It's good economically. It's good environmentally."

Stakeholders who expressed concerns about the bill "are going to be the primary players over the course of the next two years as we develop the regulations that this bill talks about," she said.

Styrofoam recycling is available in every state around Arkansas, Webb said, noting that in Ohio the foam is recycled into building materials, among other things.

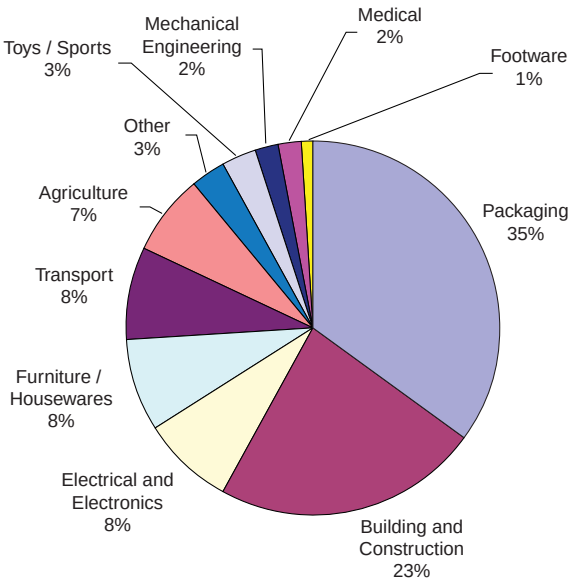
Wendy Cravens, deputy director of the Benton County Solid Waste District, said the agency already recycles the plastic foam.

Styrofoam that home or business owners drop off at the facility is soaked in a special chemical solution that reduces the material into a polymer that can be used in asphalt or in plastics.

She said the pilot program, which began last October, has cost the agency about $2,000 and later this spring the polymer collected so far by the agency is to be used by the Benton County Road Department. Several states currently use the polymer in the asphalt they use on roads.

Source:
Environment and Plastics Industry Council
www.plastics.ca/epic

Use of Plastics



Source: www.wasteonline.org.uk

Source of generation of waste plastics

Household: Carry bags, Bottles, Containers, Trash bags

Health and Medicare: Disposable syringes, Glucose bottles, Blood and uro bags, Intravenous tubes, Catheters, Surgical gloves

Hotel and Catering: Packaging items, Mineral water bottles, Plastic plates, Glasses, Spoons

Air/Rail Travel: Mineral water bottles, Plastic plates, Glasses, Spoons, Plastic bags

Source: http://edugreen.teri.res.in

GE Plastics' Ecomagination Materials are Used for Auto Body Panels – Replacing Heavy Steel & Cutting Greenhouse Gases

GE Plastics announced the company's newest products to join the GE ecomagination★ portfolio, offering the environmental and economic advantages of replacing traditional steel with Noryl GTX★ resins in automotive body panels. Complementing recently launched ecomagination products including Xenoy iQ★ and Valox iQ★ resins, Noryl GTX resins not only reduce weight to help lower fuel consumption and carbon dioxide emissions, but also are potentially recyclable. Further, they give designers greater creative latitude.

Expanding the ability to address all phases of the product lifecycle with the introduction of these ecomagination inductees, GE Plastics reinforces its commitment to helping OEMs develop more environmentally responsible and attractive cars.

Using lightweight, versatile Noryl GTX resins for on-line paintable auto body panels instead of steel can slash part weight by up to 50 per cent. Less weight promotes better fuel efficiency, helping to cut both consumer expenses and greenhouse gas emissions.

In fact, if every car on the road in Europe today had fenders made of Noryl GTX resins, the annual savings would equate to 530 million liters of fuel, about 650 million euro (based on 2006 average fuel prices) and a reduction of around 1.3 million tons of carbon dioxide (CO_2) emissions. The same level of savings could be achieved by taking 500,000 vehicles off the road – equivalent to all of the cars in Belgium as of 2004.

Since 2001, more than 10 million cars have already been produced with fenders molded from Noryl GTX resin. Given that if a car can be built 100 kg lighter, it will use 0.8 liters less fuel to travel 100 km, the drivers of these vehicles have already avoided the use of 155 million liters of fuel, saved approximately 195 million euro in fuel costs, and avoided 370,000 tons of CO_2 emissions. The same would be possible by removing 140,000 cars from the roads in Europe - equal to all the cars in Slovenia in 2004.

At the same time, these GE Plastics resins can offer recycling options to help reuse material. WIPAG, the leading recycler for automotive plastic composites – such as two- or three-layer interior parts and painted exterior parts – can help close the lifecycle loop for Noryl★ resins by taking a product made with Noryl resin (such as a front fender), removing the painted color from the part with their technology and repelletizing it. Punching scraps from production of instrument panels are separated by WIPAG's composite separation technology. The high quality recyclates of Noryl resins are being re-entered into the product lifecycle to create a new product - in the original application. By this process, WIPAG works with GE to help reduce the environmental impact throughout Noryl resin's lifespan.

Further, these resins offer greater design freedom than metal, enabling carmakers to create bold and exciting shapes and configurations to attract consumer interest. "Our resins address two of the most pressing issues for today's auto buyers – cutting their fuel bills and finding a new vehicle with tremendous style and innovation," said Derek Buckmaster, global market director, Exterior Body Panels & Glazing for GE Plastics.

Still another benefit for consumers is the potential to reduce insurance premiums through the use of plastic fenders. When designed in the right manner, these fenders can lower the insurance category for European vehicle owners due to their lower damage performance in low-speed insurance tests.

This can represent cost savings for the car owner. In addition, body panels molded from Noryl GTX resin resist corrosion and small dents, helping to reduce maintenance costs over the life of the vehicle. Noryl GTX resins blend polyamide (PA) and modified polyphenylene ether polymer (PPE) technology. They combine the dimensional stability and heat resistance of PPE polymer with the chemical resistance and flow of PA polymer. The result is a chemically resistant material with the stiffness, impact resistance, and heat performance required for on-line painting. As example, Citroën Picasso fender is made with GE's Noryl GTX★ Resin.

Source: GE Plastics