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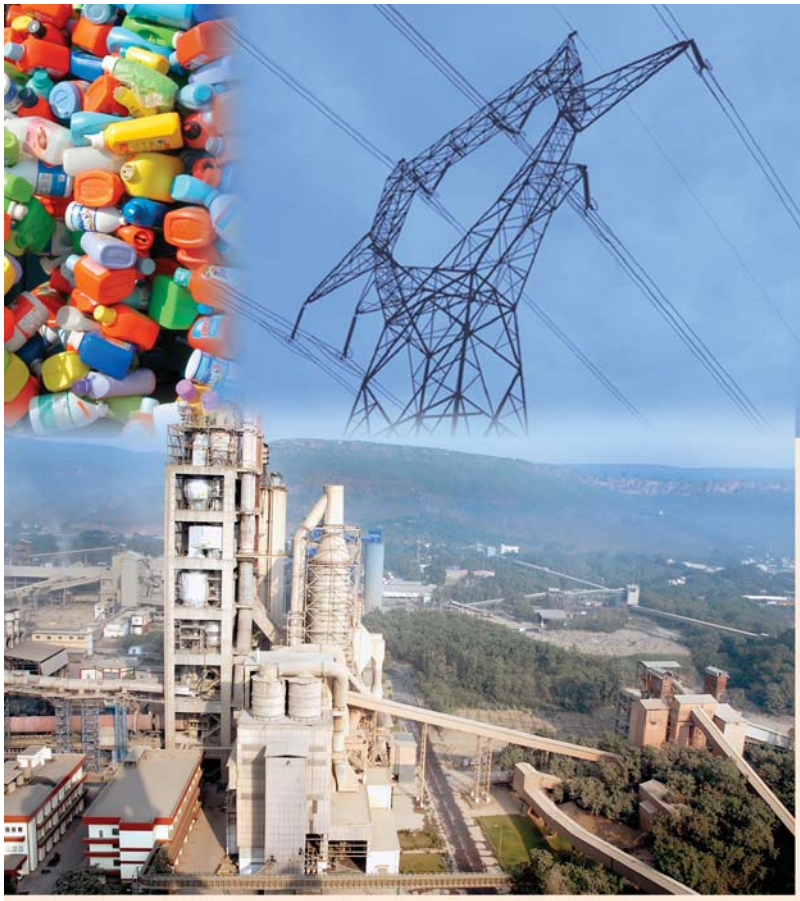

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INDIAN CENTRE FOR PLASTICS IN THE ENVIRONMENT

Olympus House, 2nd Floor,
25, Raghunath Dadaji Street, Fort, Mumbai – 400 001.
Tel.: 022-22617137 / 22617165 / 22617168
E-mail: icpe@vsnl.net; icpe@envis.nic.in
Websites: www.icpeenvis.nic.in; www.envis-icpe.com; www.icpenviro.org

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1009, Vijaya Building, 10th Floor, 17 Barakhamba Road, New Delhi - 110 001.
Tel.: 011-2332 6377 • Fax: 011-2332 6376 • E-mail: icpedelhi@bol.net.in

Area of Activity
Capacity Enhancement Programme on Management of Plastics, Polymer Wastes and Bio-polymers, Impact of Plastics on Eco-System

Head of Institution
Mr. K. G. Ramanathan, President-Governing Council
Mr. Sujit Banerji, Executive Secretary/Member-Executive Committee

ICPE-ENVIS Co-ordinator
Mr. T. K. Bandopadhyay, Sr. Technical Manager

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ENVIS is sent free of cost to all those interested in the informations on Plastics and Environment

Editorial

ICPE-ENVIS Centre has been publishing the ENVIS Newsletter since 2003. The Newsletter has been bringing important information on various issues on Plastics - its positive impact on Environment, problems of Plastics Waste Management and the possible scientific solutions; vital data on Lifecycle Analysis of Plastics and Energy Savings by Plastics have been provided in various issues of the Newsletter. It will be our endeavour to continue our work in this direction to build up more data in the area of activity and to reproduce the same in more user-friendly way. The current issue of ENVIS Newsletter has adopted a new approach as per the suggestions of the ENVIS Headquarters in the Ministry. Readers may please send their comments and suggestions to improve the quality of the Newsletter.

Readers are also requested to visit ICPE-ENVIS website: www.icpeenvis.nic.in to view the updated information on issues related to Plastics in the Environment.

T. K. Bandopadhyay
Editor - ICPE-ENVIS Newsletter

Readers are welcome to send their suggestions, contributions, articles, case studies, and new developments for publication in the Newsletter to the ICPE-ENVIS address.

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Closing the Loop

Despite the negative publicity over plastics waste, polymer recovery is increasing across Europe, reports Jan-Erik Johansson*

Plastics litter has been headline news in recent months. Reducing the amount of waste going to landfill is an important way of tackling this issue.

The good news is that in Europe the amount of waste plastics going to landfill has fallen steadily since 1999. Overall recovery of plastics waste in the EU-25, plus Norway and Switzerland, reached 50% in 2006, according to a recent report by PlasticsEurope.[1]

Total recovery rates, which include recycling as well as energy recovery, are up from 47% in 2005. What this means is that we are now recovering the same amount of plastics as we are putting into landfill (C&I 2008, 3, 7).

An important element of the UK's strategy to evade landfill is to promote recycling. Recycling of end-of-life plastics stood at 15.7% in the UK in 2006, compared with an average of 19.7% across the EU-25, plus Norway and Switzerland.

The plastics recycling industry is growing strongly in the UK. This expansion of plastics recycling is not only mandated by European waste management legislation, but also sparked by rising prices for virgin materials and improved waste collection and sorting technologies.

To move away from exporting plastic packaging waste for treatment overseas, more PET recycling capacities are springing up in the UK. The world's largest bottle recycling facility is currently being built not at Coca Cola's headquarters in Atlanta, Georgia, but in Hemswell, Lincolnshire (C&I 2007, 18, 10). It can deal with PET (drinks) and HDPE (milk) bottles and is expected to come on stream commercially later this year. It will be capable of handling up to 100,000t of mixed plastic bottles annually.

PET bottle collection grew to see 40% of all PET bottles in Europe collected for recycling in 2006. The recovered PET (rPET) is partly made into polyester fibres for the textile industry; for example, it takes 25 two-litre PET bottles to make one 'fleece' garment. Another option is polyester sheet, but as recycling grows these markets become saturated. This makes it increasingly interesting to close the loop and turn PET into drinks bottles again.

A number of approaches have been developed for producing food grade rPET. In a multi-layer system, for instance, recycled material is covered with or sandwiched between virgin materials. But the use of rPET for direct food contact is expanding, not least because drinks producers such as Coca Cola are facing pressure from consumers to use recycled materials.

In brief

- Overall recovery of plastics waste in the EU-25, plus Norway and Switzerland, reached 50% in 2006.
- More than 70% of the UK's plastics waste is landfilled, compared with less than 10% in Switzerland, Denmark, Sweden and Austria.
- The world's largest bottle recycling facility is being built in Lincolnshire, UK.

** Jan-Erik Johansson is Advocacy Director of PlasticsEurope and a Chemical Engineer*

Mechanically, food-grade rPET can be produced through a super cleaning process, for example, involving a hot wash using caustic soda and low foaming detergents. Typically, a decontamination process follows either before or after extrusion, involving heating for at least four hours at 200°C under a vacuum or in an inert atmosphere such as nitrogen.

Mechanical recycling accounted for the bulk of all plastics recycling in Europe in 2006 as 19.1% of all waste plastics went through this process, up 1.7% on 2005. The UK performed slightly below the European average with 15.7% mechanical recycling, according to the Plastics Europe report.

In addition, the recycling of PVC window frames and other profiles is increasing exponentially and grew by 84% on 2005 levels in 2006. Collection schemes for windows and window related profiles exist in many European countries, including the UK. The PVC granules from window frames and profiles are reused for producing new PVC construction products.

Feedstock recycling, which involves decomposing the polymers into their constituent components, is an interesting niche application. It has the advantage that it is more flexible over the composition of the feed material and more tolerant to impurities than mechanical recycling, although it is capital-intensive and requires large quantities of plastics to be economically viable.

One way to achieve this is a process of gasification. The long polymer chains are broken down into small molecules, for example, into synthesis gas. Syngas, consisting of carbon monoxide, carbon dioxide and hydrogen, can then be used as a basis for methanol, oxo-alcohols, ammonia and methyl formiate. These

in turn serve to produce a wide range of organic chemicals – including plastics. Before repolymerisation, the matter needs to be decolourised and contaminants removed.

Chemical recycling of plastics is also possible through pyrolysis, that is, heating the waste pellets in the absence, or near absence, of oxygen. This technology can produce a naphtha feedstock for petrochemical processing. Treating the pyrolysis gases in a catalytic converter and condenser system yields a hydrocarbon distillate comprising straight and branched chain aliphatics, cyclic aliphatic and aromatic hydrocarbons. Through careful condensation and fractionation, these gases can be turned into petroleum distillate. A desulphur unit makes the process complete and turns the plastics waste into diesel.

End-of-life plastics can also be used as a reducing agent in the blast furnaces of steel and non-ferrous mills. Pellets made from mixed waste plastics partially replace coke in the production of pig iron from iron ore. The heat in the furnace breaks the plastics down into synthesis gas, which then reduces the iron ore to pig iron. This method has been practised on a large scale in Germany for many years.

Although promising, feedstock recycling is not very widespread. Only five countries in Europe have capacity for feedstock recycling: Germany, Norway, Sweden, Austria and Poland. In 2006, it accounted for only 0.6% of all plastics waste treatment in the EU-25 plus Norway and Switzerland, down 1% from 2005. This is mainly due to reduced conversion in a gasification plant in Germany, but also due to the challenging economics of such technologies.

But increasing recycling is only one way of reducing landfill. Integrated waste management requires a rational and all encompassing analysis of the environmental impact related to the different possibilities for treating waste. In 2001, a study conducted by the Netherlands-based research organisation TNO for PlasticsEurope forecast that mechanical recycling would be optimal at 15-20% of the plastics packaging waste volume. More recycling, the study concluded, would not reduce the environmental impact, but would increase costs by a factor of three.

This is because the collection, shipment, cleaning and sorting of plastics packaging waste, which is often mixed and contaminated by dirt, generates an environmental impact itself and this can outweigh the benefits of recycling beyond a certain volume. Additionally, the required quality of the recyclate needed for a specific application may not be met, which might mean that the material cannot be put back on the market.

Today, most countries achieve around 20-30% in plastics recycling, even in the most environmentally conscious countries in Europe. This increase, compared with the TNO forecast, is a result of innovation in cleaning and sorting technology that has improved the environmental impact of recycling.

If it is difficult to get beyond 20-30% recycling, what is the most eco-efficient way to deal with the remainder? Plastics can be described as solid oil, so landfilling them would amount to putting oil into the ground. The high energy content in plastics is too valuable to throw away and well worth recovering.

Energy recovery from waste is relatively undeveloped in the UK where it accounted for just 7% of plastics waste treatment in 2006, compared with 30.3% in the EU-25 (plus Norway and Switzerland), and more than 65% in countries such as Austria, Denmark, Sweden and Switzerland.

An additional efficient recovery route involves the use of solid recovered fuel (SRF). When all eco-efficiently recyclable items are removed, SRF can be prepared from the residual organic fraction of, for example, household waste. This mixture of wood, paper and plastics can be separated and converted into a substitute fuel. It can be used for co-combustion in cement kilns, paper mills and power plants where it replaces coal or other solid fuels.

A combination of these different techniques is needed for eco-efficient waste management. Diverting waste from landfill is also a boon to the climate because it reduces emissions of methane, a greenhouse gas 23 times more powerful than CO_2.

Reference:
1 The compelling facts about plastics 2006, PlasticsEurope, Brussels, January 2008.

(Source: Chemistry & Industry – 24 March 2008)

Plastic Power

Producing energy from plastics could be crucial weapon in the EU's quest to reduce levels of waste going to landfill, writes Sean Milmo

In brief

- Due to be introduced later this year, the EU's waste framework directive aims to reduce the amount of waste going to landfill.
- In 2006, nearly 20% of plastics was recycled, and 30% was recovered as energy.
- More energy recovered from plastics could potentially further reduce amounts being landfilled.

New EU legislation, in the form of the Waste Framework Directive (WTD), is aiming to tighten up rules on waste management to ensure that there is more prevention of waste. A major difference that has emerged between the plastics industry and politicians is that the MEP's want to give absolute priority to recycling. The plastics sector, on the other hand, is looking for a balance between recycling and energy recovery. This would mean that as much as possible of the waste that cannot be mechanically recycled is turned in to energy or even into polymer feedstocks.

The legislation is due to be finally approved later this year by the Council of Ministers, representing the governments of the EU's 27 member states, and the European Parliament. The council has already reached agreement on a common position on the content of the directive. Parliament is scheduled to vote on the legislation in a second reading.

The directive aims to clarify and define what is waste, recycling, recovery and disposal. It attempts to make a clear distinction between recovery and disposal. As a result, the use of landfill, which is regarded as excluding any attempt at recovery, will become a last resort.

'The objective of the directive is to create the highest value out of waste but how that highest value will be achieved can be a difficult question to resolve,' says Harald Kaeb, managing director of the European Bioplastics Association, Berlin.

The plastics industry reckons that high levels of recovery of waste can be reached by exploiting the energy content of plastics. In 2006, nearly 20% of plastics was recycled into other products or materials while 30% or 7.4 mt was recovered as energy, according to PlasticsEurope, the industry body representing polymer producers. This 30% of plastics is theoretically capable of generating nine gigawatts of energy, PlasticsEurope says. This is the equivalent of nine large power stations working at 100% efficiency with cogenerated power and steam.

Energy recovery is seen by the plastics industry as well as by much of the waste management sector, as crucial to finding environmentally positive ways of dealing with unrecycled mixed municipal solid waste. Currently less than 40% of EU municipal waste is recycled, while nearly half is landfilled and less than a fifth is recovered for energy through incineration.

'Plastics have a high calorific value close to that of gasoline or diesel and much higher than coal or wood,' explains Jan-Erik Johansson, PlasticsEurope's regional director for North Europe. 'Plastics accounting for 10% by weight of a mixed waste stream can make up 30% of its calorific value.'

If amounts of waste going into landfill are to be drastically reduced – which is one aim of the directive – energy recovery appears to be the obvious major alternative. In the longer term, the plastics industry would like the use of gasification and/or pyrolysis processes so that mixed waste with a plastics content can be turned into chemical feedstocks for manufacturing polymers and other products, or into electricity or fuels. Gasification transforms the waste into syngas, comprising carbon monoxide and hydrogen, from which methanol can be made as a base feedstock.

'Gasification will offer another route besides incineration in energy recovery,' says Aafko Schanssema, a consumer and environmental affairs specialist at PlasticsEurope. "This form of waste management will fit into the new infrastructure of biorefineries and other facilities which will be established in Europe to provide new low-carbon sources of energy and raw materials from biomass and other waste."

In this common position on the waste framework directive, the council backed the use of gasification and pyrolysis. It decided, however, that incineration would only be categorised as an approved energy recovery method if the incinerator is used for both the generation of electricity and heat with an energy efficiency of at least 60%.

'This efficiency standard is not linked to the energy content of the waste or the amount of plastic in it,' says Schanssema. 'The determining factor is the combination of heat and power. This suits countries like Denmark where there are a lot of district heating system linked to incinerators producing both stem and power. But it is not much benefit in countries like Italy, which does not have an infrastructure for heat and power facilities.'

Some MEPs want even stricter controls on the use of incineration in the belief that as much recycling as possible should be encouraged. In particular, they wish to deter companies from avoiding recycling by resorting directly to energy recovery. 'There are some MEP colleagues who are opposed fundamentally to the idea of energy from waste plants and who will never vote for them in any shape or form,' says Caroline Jackson, a UK Conservative MEP and rapporteur on the directive for the Parliament's environment committee.

In addition to the greater emphasis on recycling, MEPs want the legislation to include targets so that EU countries are under pressure to raise levels of waste prevention, re-use of products or components and of recycling. In its common position the council ignored targets, even though Parliament had given high priority to their adoption in its first reading. 'It would be wrong to miss the opportunity to ensure that this directive does more than supply a set of definitions,' says Jackson.

She is proposing that by 2012 member states should stabilise their output of waste at 2009 levels even though municipal waste has been growing by an average of 2% / year since the mid-1990s. By 2020 the amount of household waste re-used or recycled in the EU should also be increased to a minimum 50%.

MEPs want close adherence to a five-stage waste management hierarchy set out in the directive. This starts with prevention of waste, then re-use, followed by recycling, after which comes recovery, including energy recovery, and finally disposal, such as landfill.

The council agreed that departure from the hierarchy may be 'necessary for specific waste streams when justified for reasons of, inter alia, technical feasibility, economic viability and environmental protection.'

This variable approach would appear to allow bioplastics waste, which because of its low quantities, is being excluded from mechanical recycling processes or even in some cases composting operations, to bypass the hierarchy. 'Until we have higher volumes of bioplastics in the marketplace, the best option is for bioplastics waste to go straight to the energy recovery stage', says Kaeb.

In response to the desire of some MEPs for a mandatory hierarchy, Jackson is proposing that only after 'consultation and involvement of citizens and stakeholders' can divergence from the five-stage system take place. 'The directive must make clear that departures from the hierarchy cannot take place casually and must be done as part of an ordered process.'

However, PlasticsEurope claims that such a 'bureaucratic' approach will hamper the development of new processes such as gasification, in which there will be a need to switch between energy and feedstock recovery. 'There are a lot of innovations taking place with technologies which can make waste management of plastics more efficient,' says Schanssema. "The legislation should be phrased in such a way as to allow the development of the innovations of the future."

Jackson's task is to find a compromise between what Parliament and the council wants. In return for the support of the council for its recycling target, Parliament may soften its stance on the hierarchy, which will give the plastics industry more of the flexibility it desires.

Sean Milmo is a freelance writer based in Essex UK.

Source: Reprinted with the permission of Neil Eisberg Editor, Chemistry & Industry

Plastics
Recycling Technologies

A Note prepared by Indian Centre for Plastics in the Environment

Human consumption has far outstripped available resources causing a serious challenge to our future generations. Recycling as a process has been given a top priority in the world body – UNO.

The selection of methodologies and processes for the management of plastic wastes available from pre-consumer sources and end of life products may be approached using various strategies, all of which should include a preliminary analysis of the available recovery options.

While determining the methodologies of recovery system, it is required to make a distinction between different recovery options, as below:

Recycling of Plastics has been classified into 4 main categories:

A. **Primary Recycling** – Conversion of waste plastics into products having performance level comparable to that of original products made from virgin plastics.

B. **Secondary Recycling** – Conversion of waste plastics into products having less demanding performance requirements than the original material.

C. **Tertiary Recycling** – The process of producing chemicals/fuels/similar products from waste plastics.

D. **Quaternary Recycling** – The process of recovering energy from waste plastics by incineration.

International Standards like ISO refers Plastics Recycling as a Recovery Process and the different categories of recovery processes are broadly as below:

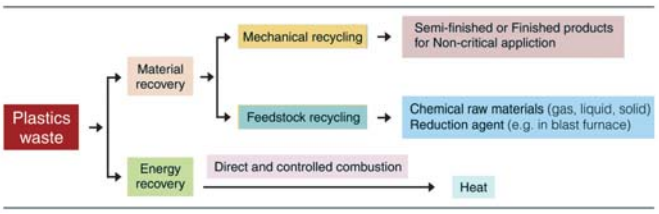
Recovery has been divided into two categories – MATERIAL RECOVERY and ENERGY RECOVERY.

The processes considered under Material Recovery are:

1) Mechanical Recycling,
2) Feedstock Recycling, and
3) Biological Recycling.

The category considered under Energy Recovery is direct and controlled combustion to generate heat.

The schematic diagram of some plastic recovery options.



MATERIAL RECOVERY

1) Mechanical Recycling:

This is the most preferred and widely used Recycling Process due to its cost effectiveness and ease of conversion to useful products of daily use. The limitation of this process is that the process requires homogeneous and clean input.

The process of Mechanical Recycling of waste plastics into products of varying usefulness mostly involves the following essential steps:

a. Collection / Segregation
b. Cleaning & Drying
c. Sizing / Chipping
d. Agglomerating / Colouring
e. Extrusion / Pelletisation
f. Fabrication into End Product

Each of the above steps involves a series of operations.

a. Collection / Segregation:

The basic principle of plastic/polymer processing is that the polymeric materials under processing are required to be compatible with each other.

Certain polymeric materials are compatible with each other at all proportions. For example, LDPE and LLDPE are generally compatible to each other at all proportions.

However, it is to be remembered that even differing molecular weight variety of the same polymer may not be compatible for useful purpose. For example, phase separation may occur if a high molecular grade of LDPE is processed with a very low molecular weight LDPE.

The advanced technology of separating/segregating different types of waste plastics involves 'Floatation Process'. In this process, the property of the varying densities of different plastics is made use of for segregating different types of plastics.

However, in the Indian context, this separation or segregation process, in many cases, is done by manual process utilizing the availability of cheap and expert labour force.

In case the waste is contaminated with embedded metals, proper method of separating the metals/other contaminants is required.

b. Cleaning & Drying:

The scale of cleaning depends on the type of waste. Generally, industrial waste does not require significant cleaning operation, whereas, post-consumer waste requires proper cleaning. Whenever a cleaning operation is involved, it is to be ensured that the water or any other cleaning material used, should be discharged after ascertaining that the discharge does not contain any objectionable substance. A proper Treatment Device may have to be deployed – like a water treatment plant/effluent treatment plant. For drying, a suitably designed drier is used.

Many industries situated outside the metropolises, use open space for natural drying of the cleaned waste.

c. Sizing/Chipping:

The cleaned plastics waste is then required to be properly sized so that those may be fed into the extruders for processing and pelletizing. The sizing operation depends on the type and shape of the waste plastics.

During this process, attention is required to separate any powdery material from the sized / chipped plastics.

d. Agglomerating/Colouring:

In the next operation the sized plastics waste is mixed with colour master batch in high-speed mixers/ agglomerators and the output is ready for extrusion into pellets.

e. Extrusion/Pelletisation:

This is the most important part of the process wherein the sized/chipped plastics are plasticised and regranulated to make the plastics material ready for fabrication next. The type and size of the Extruder depend on the type and volume of the plastics waste.

f. Fabrication into End Product:

Finally the reprocessed plastics granules are used as raw material for producing end products using similar fabrication machines like Injection Moulding/ Extrusion, etc., depending upon specific requirement.

2) Feedstock Recycling:

In this process the Plastic Wastes are converted into:

- **Monomer –** About 50% Recovery is possible.

  Limitation – Large Scale Process generally setup by the basic raw material manufacturers.

- **Fuel –** Close to 100% Recovery is possible divided into main fraction of liquid fuel (about 75%), solid fuel (about 15%) and gaseous fuel (about 10%).

  The technology, however, is proprietary in nature and is available only to select technology provider in the developed and developing countries.

  One Indian scientist (Nagpur-based) has developed the technology a few years back which has been commercialized in a small way. As per available information, a small plant of 5 tonne per day production capacity costs around Rs. 7 crores and can offer the liquid fuel in the market at a price of around Rs. 25 per litre.

  The fuel can be used in place of normal kerosene used for industrial purpose. It is also reported that 6 units of electricity can be generated from 1 litre of fuel thus produced.

  Advantage of this process includes use of all types of plastics including laminated plastics without creating any environmental pollution.

Blast Furnace

- **Reducing agent in blast furnace for the production of iron.**

  The carbon and hydrogen molecules in plastics (wastes) take part in the conversion reaction inside the blast furnace for the production of iron from the basic iron ore.

  Use of plastics help providing two reducing agents – carbon monoxide and hydrogen for the conversion reaction whereas the traditional coke used in the blast furnace provide only one reducing agent – carbon monoxide. A 3.0 million tons per annum capacity steel plant can use up to 0.6 million tons of plastic wastes per annum. The process is commercially used in some developed countries.

  Advantage of this process includes use of all types of plastics including laminated plastics without creating any environmental pollution.

3) Biological Recycling:

This deals with mainly composting of compostable plastics and recovery of methane.

ENERGY RECOVERY

One of the most effective methods of Recycling of Plastic Wastes for recovery of energy is the use of plastic wastes as an alternative to fossil fuel in cement kilns. The process takes advantage of the higher calorific value of plastics compared to coal. The list below gives a comparison of the calorific values of different plastic materials as compared to coal.

Polyethylene	46 MJ/kg
Polypropylene	44 MJ/kg
Polyamide (Nylons)	32 MJ/kg
PET	22 MJ/kg
Cellulose Acetate	16 MJ/kg
Coal	29 MJ/kg

ACC Cement Plant at Kymore

The use of waste plastics as co-processor in cement kilns is in use commercially in many developed countries. Recently, the process has been successfully tried in the ACC Cement Plant at Kymore under a joint project of ICPE and ACC.

All types of plastic wastes without adequate cleaning can be used in the process and the process is safe as per environmental norms. About 15% of fossil fuel can be replaced in the process without much affecting the normal production capacity of the cement kiln.

USE OF PLASTICS WASTE IN ROAD CONSTRUCTION

Construction of Tar Road using Plastics Waste in Mumbai.

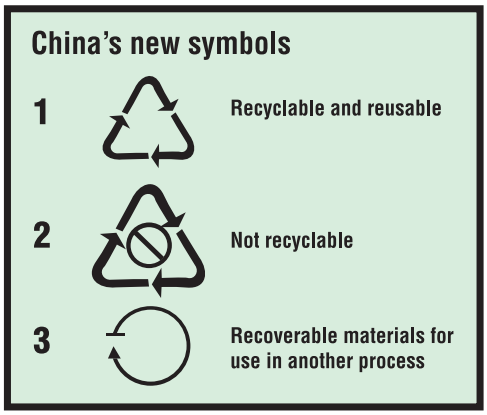
A unique process of use of waste plastics in the construction of Asphalt road has been developed in India in recent times. In the process, certain types of waste plastics (mostly polyolefins) can be blended with bitumen or coated on aggregates to improve the properties of road and at the same time to reduce the cost to a limit of about 10 to 15% cost of bitumen without sacrificing the life of the road. The process does not require any additional machinery and can be used anywhere using the same machineries used for road construction. The plastic wastes mostly carry bags and similar wastes are required to be pulverized/ shredded into small pieces which is possible by employing inexpensive / conventional machines.

Whichever form of recycling is chosen, the whole process can succeed only if an efficient solid waste collection mechanism is put in place at the first instant. The Government has already come out with The Waste Management (Handling) Rules, 2000 for this purpose. All out efforts are required to be put to implement the Government Rules on waste management.

There is a need for Government intervention/ support for encouraging recycling.

China Drafts
Plastics Bag Standards

China has taken the first steps towards implementing the new Plastic Shopping Bag law by publishing a set of draft standards detailing measurements for acceptable types of plastics bags, labeling instructions, and inspection methods.



The Chinese State Council (Cabinet) issued a ban on the production, sale and use of plastics shopping bags under 0.025mm thick, dubbed 'ultra thin plastics shopping bags' on 1 January. All other types of plastics bags are to be restricted.

The Chinese Standardization Administration published its first draft of the ban's standards on 4 February. The draft standards, drawn up following consultation with the China National Light Industry Council and the Standardization Technology Committee of National Plastic Products, comprise three separate documents, each specifying what will be acceptable for plastics bags, labeling requirements, and inspection methods.

What is a plastics bag?

The first document contains the definitions, terminology, requirements, test methods, inspection regulations, and other elements relating to the packaging, transportation and storage of plastics shopping bags.

The draft document states clearly that all plastics bags used by the retail industry and other service industries, or any plastics bag used to carry any sort of item, falls within the law.

All plastics shopping bags must be more than 0.025mm thick and free of bubbles, perforation or any other defects. They should primarily be either clear or white in colour, although other colours are acceptable.

Plastics shopping bags which are used to contain food must be clear. Any printing on the plastics shopping bags must not take up more than 20 per cent surface area.

So-called biodegradable, starch-based bags must contain at least 15 per cent starch to be acceptable.

Physical properties

Physical properties and tests required of plastics shopping bags are listed, including the accepted chemical properties of the bags.

According to the regulations, 'During transportation, bags must be covered to prevent machinery hitting the bags and suffering sun and rain effects'.

In addition, instructions are given on how the plastics shopping bags should be stored in a clean and dry environment free from contamination. Bags will have an expiry date not more than a year from the production date.

The regulations also state that manufacturers should determine the bags' maximum storage time according to the bag's physical properties.

Identification and labeling

A very detailed set of rules govern the information which must be printed on the plastics shopping bags.

Symbols indicating whether the bag is degradable, reusable or otherwise have to be shown. Bags must include the manufacturer's name, its dimensions in millimeters, strength in kilograms and chemistry including material resins, fillers, plasticizers, reinforcing agents and other additives have to be printed on the bag.

Standardization code numbers specifying the approved material types of the plastics shopping bags is provided in the regulations and the bags must also be printed with English acronyms in the text (such as PP).

Bags containing recycled material must list all the recycled resins used and their respective weight-based percentages. Bags for medical purposes or chemicals and pesticides must not be reused.

Bags for food usage must also carry a sign 'For food use', indicating that the plastics may be used in direct contact with food; in the fresh food markets where most Chinese shop for meat and seafood, vendors use plastics shopping bags without inner wrapping before handing it to their customers.

At the same time, food-used bags must reflect the resin colour and should not have added color pigments.

The specifications include diagrams of the required positioning of various markings which all plastics shopping bags must carry.

Additionally, as part of the consumer education campaign, all bags must carry the Chinese slogan, 'To protect the environment and conserve resources, please reuse this bag as many times as possible'.

Other safety warnings such as keep away from infants and children to avoid suffocation must also be printed.

Inspection methods

The third regulation specifies the sample testing types, and also lays down guidelines for the bags' appearance, signs, thickness, length and width, and load strength, and outlines the methods for quick inspection, testing and evaluation.

The regulation states that every batch of plastics shopping bags must be inspected and that a batch of same model, same material composition bags which are produced continuously should not exceed 5 tonnes.

Since the minimal basic requirement for the plastics bag is that they must be more than 0.025 mm thick, inspectors are supplied with diagrams to show how they should check the plastics shopping bags' thickness.

Inspectors are also instructed to smell the bags for 'strange' smells presumably looking for toluene inks used in the printing, a ban which will soon be imposed in the Method for Administration on Recycling Packaging Materials.

The Chinese Standards Authority is 'open to feedback' on its draft regulations. Industry was granted exactly 30 days to submit their suggestions, or objections, to the draft. In reality, because of the New Year holiday, all Chinese businesses were closed from 7-21 January, leaving industry one week to make any submissions.

Each of the three documents contains standardization codes scattered throughout: GB/T xxxxx2008, (with the XXXX to be replaced by the actual codes).

The speed and details in which these regulations have been written suggests that they have actually been in the planning stage for many months. It also suggests that once passed, the Method for Administration on Recycling Packaging Materials will be implemented with similar speed.

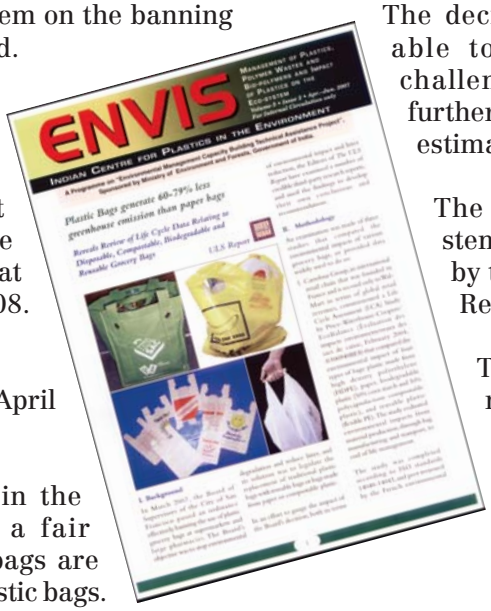
California Ban on Plastics Bags
Struck down by Court in Oakland

ICPE-ENVIS had carried a news item on the banning of plastic carryout bags in Oakland.

It is now learnt that the California Court has struck down the ban on plastic carryout bags. The Court has maintained that the city had not conducted an adequate study on the environmental impact of the ban that went into effect on January 18, 2008. This ban was never enforced.

The decision was handed down April 17, 2008.

The Court had found evidence in the record that supports at least a fair argument that single-use paper bags are more damaging than single-use plastic bags.


ENVIS
Indian Centre for Plastics in the Environment

The decision means Oakland will not be able to implement its ban unless it challenges the decision or conducts a further environmental impact review at an estimated cost of $125,000.

The Alameda Country court decision stem from a lawsuit filed on August 3 by the Coalition to Support Plastic Bag Recycling.

The Coalition argued that the manufacturing or paper bags generates 50 times more water pollutants than the manufacturing of plastic bags.

Less Plastic Going to Landfill

Recovery of plastics has finally reached the 50% mark across Europe: the point where we are recycling as much plastic as we are putting into landfills. Plastics Europe's report – the compelling facts about plastic reveals that in 2006 half of all post-consumer plastics ending up as waste were being used again either through straight-forward recycling or energy recovery. Recycling rates increased to 19.7% and energy recovery rate to 30.3%. As the same time, demand for plastic increased 4% to a total of 49.5m tons across Europe (EU25 + Norway and Sweden).

'Improved collection and sorting techniques managed under better national schemes lead me to forecast that in 2007, growth rates for recycling and energy recovery will be similar to 2006,' says Jan-Erik Johansson of PlasticsEurope.

Seven countries, including Switzerland, Denmark, Germany, Austria, the Netherlands, Sweden and Belgium, now recycle more than 80% of their plastics waste, the ultimate goal being to divert all plastic from landfill. But half of Europe recovers less than 30% of their waste. And countries like the UK, Ireland and Greece are at the bottom end of the scale, recovering only about 20%.

The recycling rate is determined mainly by how efficiently bottles and films are collected and separated. Countries can fairly quickly improve their recycling rate by organizing their collection and separation schemes, according to Johansson, but moving beyond that is difficult, he says.

Europe now produces about 25% of the total estimated worldwide plastics production of 245m tons. The overall turnover for the whole of the industry is more than Euro 280bn.

Source: Chemistry & Industry 2008, 2, 8

Domestic News

Banning of Plastic Bags – Notifications

Department of Public Relations, Chandigarh

Whereas the Chandigarh Administration is of the opinion that the use of polythene/plastic carry bags is causing grave injury and is detrimental to the environment and the health of human beings as well as animals; the Administration, Union Territory, Chandigarh exercising the delegated powers under Section 5 of the Environmental (Protection) Act, 1986 hereby directs that no person including a shopkeeper, vendor, wholesaler or retailer, trader, hawker or *feriwala* shall use polythene/plastic carry bags for supply of goods in polythene/plastic carry bags in Union Territory, Chandigarh.

Coimbatore Municipal Corporation

Bearing the environmental safety in mind and in order to preserve the beauty of the city and its suburbs this Council has decided to ban one-time used plastic articles from being manufacture, used, sold and stored by any cities within Coimbatore Corporation. Accordingly the Coimbatore Corporation Council in its resolution No.68 dt.20-6-2000 and resolution No. 170 dt. 11-6-2001 banned that plastic carry bags below 20 micron thickness, plastic tumblers, manufacture of plastic sheets and sale and also decided to impose penalty on those who violate provisions therefor.

As per the standing health community in No.18. dt 9-1-2008, the Resolution is passed and placed before the Council for its approval.

Industry has submitted representation to the respective authorities to amend the notification appropriately in line with MOEF Rules.

Use of Plastics Waste in the Construction of Asphalt Road – ICPE-MCGM Joint Project

Use of bitumen for the construction of asphalt road has been known since long back. Major requirements of an asphalt road are:

- Good Binding Property
- High Marshal Stability
- Better Resistance to Water
- Ductility – Reduced Surface Cracking
- Penetration Value
- Reduced Plastic Flow at High Temperature

Use of certain synthetic polymers to improve the adhesion and other properties of asphalt road is also known to the road engineers. Following synthetic polymers have been used to modify the properties of bitumen for improving the quality and life of asphalt roads:

- PE – Either Wax or Resin
- PP – Homo & Copolymers
- PS
- EVA
- SBR

High cost of virgin synthetic polymers restricts their use in specific & high value/critical applications. Low cost waste plastics offer an alternative to the high cost virgin synthetic polymers. In fact, as the cost of low-end plastics waste is less than that of bitumen, there is a saving in the cost of road construction. This also provides a scientific and environmental-friendly method of disposal of low-end plastics waste.

India is considered pioneer in using plastics waste for the construction of asphalt road. Central Road Research Institute, Delhi, Thiagarajar College of Engineering, Madurai and K. K. Poly Flex, Bangalore have been working in this regard since about 2002 and have already either constructed or helped in the construction of hundreds of kilometers of asphalt roads using waste plastics in the Southern Indian States.

ICPE also encouraged development and popularization of this technology for duel purpose:

- Scientific and Environmental-friendly method of disposal of low-end plastics waste.
- Construction of better quality asphalt roads at reduced cost.

ICPE has been working with the Road Engineering Department of Municipal Corporation of Greater Mumbai (MCGM) since 2005, for popularizing use of waste plastics for the construction of asphalt roads.

Plastics waste being prepared for mixing with the bitumen and aggregate

MCGM engineers supervising the operation

Ingredients being mixed with aggregate

Plastics waste being added through automatic dosing machine

Aggregate mixture being put inside hot mixing chamber (rotor)

Rotor and mix discharge unit

Road laying work in process

Road laying work in process

MCGM Road Engineers supervising the construction. ICPE staff are also seen in the picture

MCGM Road Testing Engineer is testing the density of the road using automatic Nuclear Testing Device.

During the beginning of 2008, MCGM and ICPE have constructed a stretch of road near Dadar Railway Station, Mumbai (Prof. V. S. Aghase Road) using waste plastics in blend with bitumen and aggregates. A stretch of normal asphalt road, without mixing any waste plastics, also has been laid along the same road for evaluating the performance of both the roads over a period of time under similar conditions. Initial tests indicated improvement in important properties including Marshal Stability values of the asphalt road. ICPE and MCGM Engineers would monitor the performance of the road properties over a period of time.

ICPE along with Gujarat State Plastics Manufacturers' Association/Plastindia Foundation are also working with the Road & Building Department of Government of Gujarat, who has sanctioned construction of 10 kms stretch of asphalt road using waste plastics.

Plastics Saves Energy

Synergy with Energy Conference – and "India Energy Show 2008" on March 14, 2008, at Ahmedabad

Extending his greetings to the Chief Guest, Mr. Saurabhbhai Patel, Hon'ble Minister of State for Finance, Energy & Petrochemicals; the VIP's on the dais, the galaxy of delegates, technocrats, experts from the energy sector who were present at the Conference, President, Plastindia Foundation, Mr. Arvind Mehta, expressed his delight to be the Guest of Honour at the function.

Deviating from the general theme under discussion, Mr. Arvind Mehta, sought to dwell and focus on the aspects as to how plastics are proving to be worthy energy saver in various sectors. "Plastics demand the lowest energy for raw material production among other materials such as Aluminium, Copper, Zinc, Steel, etc.," he said.

"Keeping in view the emerging trends of the use of plastics in the Energy Sector, Plastindia 2009 has dedicated a pavilion exclusively for 'Plastics – Energy Saver'," he informed the august gathering.

Elaborating on the areas where plastics have contributed substantially in energy savings, Mr. Arvind

Mehta presented case studies on some important areas:

a. Plastics in Packaging
b. Plastics in Pipes
c. Plastics in Housing
d. Plastics in Automobiles
e. Plastics – Non conventional energy generation
f. Plastics in Energy

The energy efficiency of Plastics in the Packaging Industry is noteworthy he said. "Plastics", he said, "costs 1/4th; consumes 2/5th the energy; volume of waste is half and the weight of plastic packaging is 1/3rd that of other conventional materials used, and above all its recyclable properties are becoming more valuable".

Speaking on Plastics in Pipes, he said, "For every MT Steel pipes replaced by plastic pipes the power saving is approx. 23 MW".

"Use of plastic profile foam insulation alone in homes and buildings will ultimately save nearly 60 million barrels of oil over other kind of insulation. Plastic profiles with insulation save energy and it is possible to heat homes with 3 litres instead of 23 litres of fuel," he said.

Mr. Mehta stated that "In the automobile sector, use of Plastics is growing and because they have reduced tare weight and fuel consumption". "In Europe the annual fuel savings due to use of plastics in the automobile has resulted in 2.3 M T of fuel savings" he said.

"Light weight and insulation properties of plastics have enabled compact and efficient units in non-conventional energy generation," he stated.

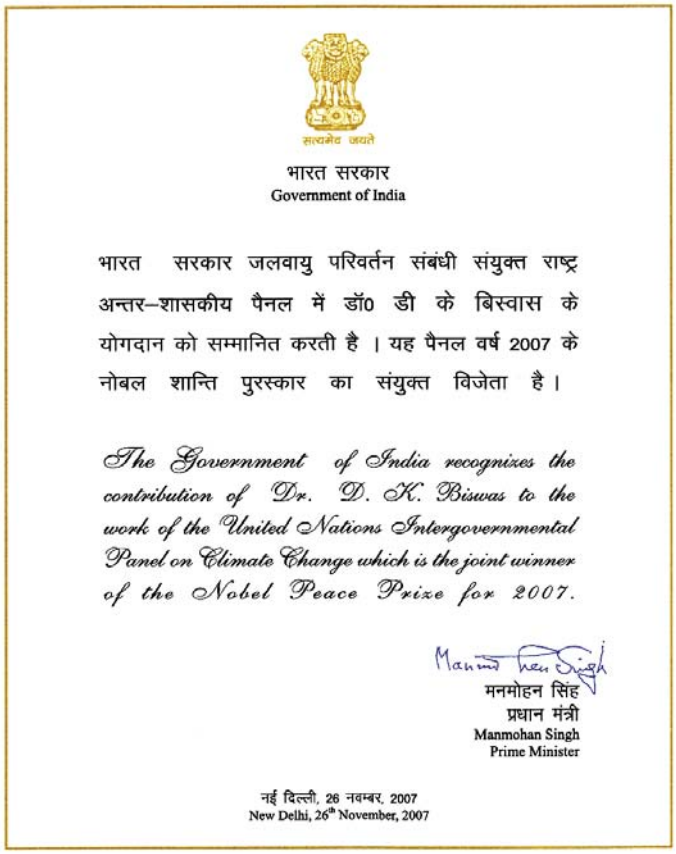
"The Compounded Annual Growth Rate of Plastics in Energy sector is around 26%, with an annual consumption of 107 KTA in India," he said, speaking of Plastics in the Energy sector. "Total cabling length in India using plastics is around 1,12,530 kms and HDPE is being used extensively for Gas Distribution in Metros across the country," he affirmed.

To conclude, he said "We are looking for an optimistic participation from the energy sector at PLASTINDIA 2009, which will only propel the growth of the Industry and encourage more innovations and product developments".

ICPE GC & EC Meeting held on 13th February, 2008 at ICPE Office, Mumbai

The Members of Governing Council and the Executive Committee of ICPE meet regularly for taking Policy Decisions on various activities to be undertaken by the Centre and for reviewing the status of the same. Seen in the picture are: Mr. K. G. Ramanathan, President – Governing Council, and Mr. J. B. Kamat, Member, (representing CPMA). Others in the picture are: Mr. Arvind Mehta, Mr. Vijay Merchant, Mr. Rajiv Tolat, Mr. S. K. Sharma and Mr. J. V. Raval (Members representing Plastindia Foundation), Dr. T. K. Chakravarthy (DCPC), Mr. Rajiv Dhar (IIP), Mr. Prabuddha Dasgupta (HUL), Mr. P. K. Sahoo (CIPET) and Mr. P. V. Narayanan (Advisor, ICPE).

Nobel Peace Prize 2007



सत्यमेव जयते

भारत सरकार
Government of India

भारत सरकार जलवायु परिवर्तन संबंधी संयुक्त राष्ट्र अन्तर–शासकीय पैनल में डॉ0 डी के बिस्वास के योगदान को सम्मानित करती है । यह पैनल वर्ष 2007 के नोबल शान्ति पुरस्कार का संयुक्त विजेता है ।

The Government of India recognizes the contribution of Dr. D. K. Biswas to the work of the United Nations Intergovernmental Panel on Climate Change which is the joint winner of the Nobel Peace Prize for 2007.

मनमोहन सिंह
प्रधान मंत्री
Manmohan Singh
Prime Minister

नई दिल्ली, 26 नवम्बर, 2007
New Delhi, 26th November, 2007

Dr. D. K. Biswas is the Advisor-Principal (Environmental Affairs), ICPE

www.envis-icpe.com

46,164 hits in January 2008

Appreciation

ICPE along with Maharashtra Plastic Manufacturers' Association (MPMA), has been engaged in the Plastics Waste Management Activities in Mahabaleshwar area with the co-operation of local civic authorities.

The continuous effort of ICPE and MPMA brought result in the Plastics Waste Management in Mahabaleshwar area and the local authority had acknowledged the services of ICPE and MPMA in this regard.

ICPE Participation in **Exhibition and Awareness Programmes**

National Conference on Environmental Engineering Management (NCEEM) 2008 and Silver Jubilee Celebration of the Educational Institute Tatyasaheb Kore Institute of Engineering and Technology

Kolhapur – 15th February, 2008

Section of audience

On the dais (L to R): Dr. Rao, Principal of the Institute and Mr. Sujit Banerji, Chief Guest on the occasion seen with other dignitaries

One of the most prestigious Engineering Institutes in the country had organized the Conference where distinguished experts in the field of Environmental Management took part. Mr. Sujit Banerji, President, Polymers Business, Reliance Industries Ltd. and Executive Secretary/Member-Executive Committee, ICPE, delivered the keynote address on the environmental benefits of plastics as a whole.

Mr. T. K. Bandopadhyay, Sr. Technical Manager, ICPE, participated in the planery session of the Seminar and deliberated on various Environmental issues of Plastics and its solutions.

Pune Expo 2008 - Industrial Exhibition and Seminar

Pune, 28th Feb – 3rd March, 2008

Mr. T. K. Bandopadhyay, Sr. Technical Manager-ICPE, making a presentation

ICPE Awareness Pavilion in the exhibition

Display panels on Plastics Recycling and related awareness on Waste Management along with samples of recycled plastic products were exhibited. During the technical seminar organized on 29th February, 2008, Mr. T. K. Bandopadhyay, Sr. Technical Manager, ICPE, made a presentation on Plastics – Benefits, Environmental Issues and Scientific Solutions. Mr. Rajiv Tolat, Treasurer / Member-Executive Committee, ICPE appraised the gathering on ICPE's role in handling of environmental issues with respect to plastics.

PLASTEC 2008 Exhibition and Seminar

Chennai, 21st-24th February, 2008

Mr. Soloman Pappaiah, famous Tamil speaker, conducting a public debate on "Plastics: Boon or Bane to the Environment

Chennai Plastics Manufacturers and Merchants Association had organized a 4-day Exhibition – PLASTEC 2008 during 21st-24th February, 2008. ICPE participated in the exhibition displaying the awareness material and providing information on various techniques of Plastics Recycling. The visiting public took keen interest in the information provided in ICPE Stall through display of panels and samples of recycled plastic products.

During the technical seminar, Mr. T. K. Bandopadhyay made presentation on Environmental Issues of Plastics and Scientific Solutions. Mr. Bandopadhyay also chaired the concluding session at the end of the Seminar for compiling the proceedings for recommendation to the local government on various issues relating to Plastics.

ICPE Pavilion

Visitors at ICPE Pavilion

Do Not Litter.
Keep Your Environment Clean.

- **Segregate and Throw Waste Only in Waste Bins.**
- **Use Two Bins – One for Wet Waste, One for Dry Waste.**

Plastics, Metals, Paper …
Can be recycled into useful products.

Waste Food and other Biodegradable Waste …
Can be composted into manure.

Issued in Public Interest by

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