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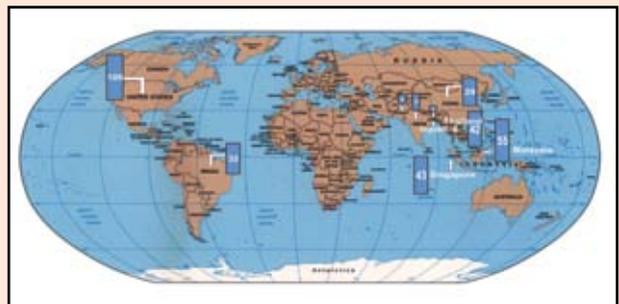
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**International Conference on
uPVC Doors, Windows & Profiles**



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**Per Capita Plastics Consumption
of Select Countries**



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**Capacity Enhancement Programme
on Management of Plastics,
Polymer Waste and Bio-Polymers,
Impact of Plastics on Eco-System**

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Government of India, Ministry of Environment and Forests have Notified the Plastic Waste (Management and Handling) Rules, 2011 in order to manage plastics waste more scientifically. Implementation of the Rules have been assigned to designated civic and pollution control authorities. An important clause in the Rule directs the municipality authorities for seeking assistance from manufacturers / brand

owners for setting up of plastics waste collection centres (for recycling of the same). However, after about a year of the Notification, this implementation of the Rule is not widely visible. On the other hand, we note that the Japan Plastics Industry Federation along with Japan Expanded Polystyrene Association volunteered to find a practical solution caused by the 'EPS Floats' for the fishing activities in the sea. An explanatory Presentation on the Marine Litter Issues in Japan, with specific reference to EPS Floats Waste - collection and recycling, has been published in this edition of ENVIS Eco-Echoes Newsletter, with permission. It is expected that large number of Indian Manufacturers would volunteer for similar actions, owning responsibility as a part of their Extended Producer's Responsibility (EPR).

Recycling of plastics is not new in India. Since the time when plastics processing took off in the country in the late 1950's / early 1960's, recycling activities also started at the same time. Initially it was driven by the necessity to augment the requirement of scarcely available virgin plastics. Gradually, plastic recycling has become a regular and profitable manufacturing activity. However, considering the fact that plastic recycling industry in India, by and large, is in the unorganised sector, it becomes important that this sector adheres to the pollution control norms especially in terms of treatment of the waste water after the cleaning operation. Micro, Small and Medium Enterprises Ministry (MSME), Government of India, took special effort to create the awareness among the clusters of small scale recyclers in Mumbai area with the assistance of academic institution of repute - University Institute of Chemical Technology (UICIT), Mumbai University. ICPE joined hands with UICIT in this awareness campaign.

The issue of Waste Management has attracted the attention of National and International Forum due to its huge impact on the environment, which is not confined by any National geographical boundary. Sustainable technological solutions to manage the waste scientifically and to convert the waste in to a resource are available. National scale Associations had organised seminars and workshops during this period where ICPE had participated and shared the information on Plastics Waste Management - Issues and Solutions. This edition carries brief of seminars as a part of Mass Awareness Activity.

The Data Sheet carries the information on Per Capita Consumption of plastics in major geographical zones in the world along with the Per Capita Consumption in some select countries.

Comments may be forwarded to ICPE ENVIS Centre.

Subscription Information:

ENVIS is sent free of cost to all those interested in the information on Plastics and Environment. 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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MARINE LITTER ISSUES IN JAPAN

Although according to the United Nations Joint Group of Experts on Scientific Aspects of Marine Pollution (GESAMP), 80% of world's marine pollution is caused by land based sources, fishing related activities also contribute to the issue. Waste caused by Expanded Polystyrene (EPS) floats, used by the fishermen for the fishing nets and other related activities, has been identified as a major issue.

Japan Plastics Industry Federation (PIIF) and Japan Expanded Polystyrene Association (JEPSA) have jointly addressed the issue to find out a practical solution mainly by collecting the waste and making arrangement for the recycling of the same. With the consent of Japan Plastics Industry Federation, the Presentation on **Marine Litter Issue in Japan** has been reproduced.

Marine Litter Issue in Japan

Japan Plastics Industry Federation



Topics

- History of Marine Litter Issue in Japan
- Development of Recycling System for Wasted EPS Floats
- Support for Treatment of Waste EPS-Floats of 'Tsunami' by JEPSA

Efforts for Marine Litter Issue in Japan (Background) Before 2004

Fiscal Year	Topics
1982	Made first problem presentation about 'Marine Pollution' by plastics (Professor Nakanishi of Nagasaki University).
1990~	Japan participated to ICC(International Coastal Cleanup). JEAN(Japan Environmental Action Network, NPO) established.
1993~1997	Held on specialized conference for seashore clean-up. (10 times during this period, organized by JEAN[NPO])
1997~	Began to study about 'Marine Litter'. (Professor Fujieda of Kagoshima University).
2000~	Set up Liaison conference among ministries concerned for 'Driftage Litter' (organizer: MOE[Ministry of Environment]).
2002~2003	Held on the 1 st & the 2 nd Investigative Commission of marine litter issues of Expanded Polystyrene.
2003~	Held on Marine Litter Summit at isolate island (every year).

Efforts for Marine Litter Issue in Japan (Background) After 2004

Fiscal Year	Topics
2004~2007	Held on Clean Seashore Act Forum (joint hosted by JEAN [NPO] & MLITT [Ministry of Land, Infrastructure, Transport and Tourism]).
2005~2006	Held on round-table conference among relevant parties regarding marine litter issues (5 times during this period).
2006	Set up Liaison conference among ministries (director-general level talk) concerned for 'Driftage Litter'.
2007~	Began domestic model investigation of reduction method regarding driftage litter. (organizer: MOE [Ministry of Environment]).
2007~	Started three-years plan of model project of accelerating treatment of driftage litter (organizer: MAFF [Ministries of Agricultures, Forestry and Fisheries]).
2009	Issued new legislation of 'Accelerating treatment of seashore driftage litter'.
2010	Distributed 'Green New Deal Fund (6 billion JPY)' for treatment of driftage litter, etc. to municipalities distributed.

Activities of business associations during this period

JPIF (Japan Plastics Industry Federation)

- ▶ (1993) Compiled 'Pellet Handling Manual' and distributed it to manufacturers and so on. (Uploaded to our website). (Purpose to prevent plastics pellet leakage from various facilities).
- ▶ (2000~) Had questionnaire investigation about implementation aspect of countermeasure against plastics pellet leakage. (Objective: manufacturers, warehouses, processing places, 547 sites in FY 2009)
- ▶ (2003) Set up guideline(brochure) of installation instances of pellet collectors using metal-meshed filter. (Uploaded to our website).

JEPSA (Japan Expanded Polystyrene Association)

- ▶ (2001) Began treatment for used floats(EPS) by heat volume reduction (Ingot method). (Mitsui mining company Ltd.) Set up 'Used' Float committee' in Japan Foam Styrene Industry Association. Provided 'precaution for use', etc. for EPS float.
- ▶ (2002~) Developed compression volume reduction machine(JEPSA).
- ▶ (2005) Set up task force in JEPSA.

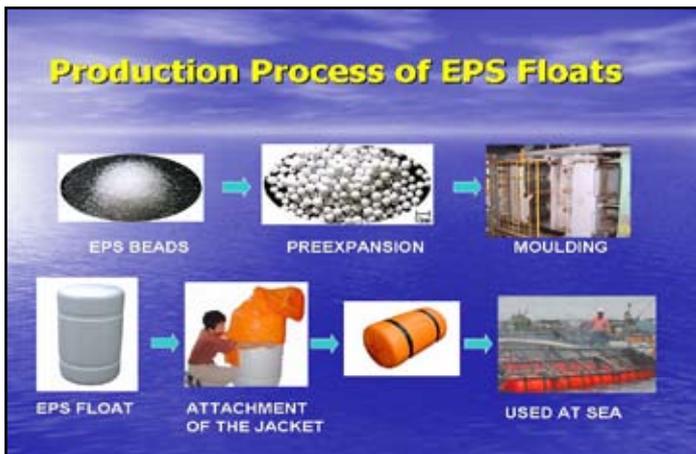
Result of used float treatment by compression volume reduction machine. (2005 ~ 2008)

→ JEPSA Group: Approx. 29,000 pieces of float(Approx. 120 tons)
Other Group: Approx. 31,000 pieces of float(Approx. 124 tons)
total : Approx. 60,000 pieces of float(Approx. 244 tons)

Development of Recycling System for Wasted EPS Floats

JEPSA (former JEPSRA)
Technical Development Department

Production Process of EPS Floats



The Conventional Treatment of the Wastes



New Recycling System for EPS Floats

A Project by the Fisheries Agency

- Program
 1. Study on the actual situation on EPS for the fishery
 2. Establishment of a "Total Recycling System"
 3. Development of application fields for recycled EPS
- Term 2003~2007(fiscal year)
- Participants
 - The Fisheries Agency, Various public organizations
 - Fisherman's Unions, Universities
 - JEPSRA
 - Japan Foam Styrene Industry Association

Activities of the Project in 2003

- ① Study of the actual situation of wasted EPS for the fishery
 - (Global Guardian Trust)
 - Mainly in Kagoshima, Kumamoto, Nagasaki
- ② Development of technology and system for recycling
 - Improvement of the compressor for EPS floats
 - Examination on the treatment of compressed EPS

Problems on recycling of Wasted Floats

Cost: Higher

(more than ¥500~1000 / a float)

1. Transporting efficiency: Low
 - [60 floats (0.3~0.4 ton) on a truck of 4ton size]
2. Water content: High [20~100%]
 - Low efficiency in thermal treatment

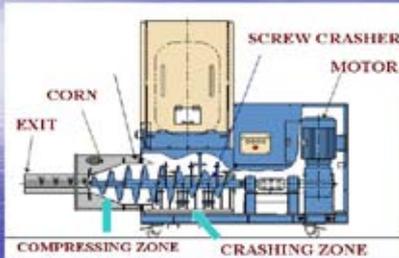
Contamination: Shells etc.

- Difficulty of material recycling
- Stench at heating

New System for Wasted Floats (Compress Treatment)

- ① Compression at the stock point near breeders by a movable compressor
 - Compression ratio: less than 1/10
- ② Transporting the compressed wastes to RPF manufacturers
- ③ Processed to RPF at the manufacturers
- ④ Applied as fuel instead of coal

The Profile of the Compressor



[Merits]

- Compression ratio by the single screw 1/10~1/20
- Moveable
- Widely applicable for materials containing water or shells
- Less smelly

The Actual Process(1) at the stock point



The Actual Process(2) at the RPF manufacture



Merits of This System

- Reduction of transportation cost through reduction of the volume of wasted floats down to less than one-tenth of the original volume
- Potable compressor system → Easy to install → Prevention of leaving or illegal disposal

Next Step

- Trials of this new system in Kagoshima and Kumamoto, Kyusyu area
- Application of this system to the other area

Support for Treatment of Waste EPS-Floats of 'Tsunami' by JEPSA



PLASTINDIA FOUNDATION RACE OF HOPE RACE DAY – MUMBAI

Royal Western India Turf Club (RWITC) and Plastindia Foundation had joined hands with the Indian Cancer Society to organize a Plastindia Foundation Race of Hope Race Day on the 27th November, 2011 in the aid of the Indian Cancer Society.

By way of displaying important panels and samples of various products made of recycled plastics, awareness message was conveyed to the large public gathering during the event.

During this event an Awareness Campaign was organized on Plastics and the Environment. ICPE showcased the awareness panels on Plastics and the Environment in the kiosk provided by the Turf Club.

The message of two –bin culture was displayed prominently. Booklets on Myths and Realities, Waste Management and Segregation at Source were also distributed.



Mr. K.G. Ramanathan, Mr. Sapan Ray and Mr. P.P. Kharas of ICPE are seen distributing the prizes

INTERNATIONAL CONFERENCE ON uPVC DOORS WINDOWS & PROFILES MUMBAI



It is reported that every human being needs daily oxygen produced by 16 big trees whereas in India 36 persons share single tree for fresh air!

Plastics in many applications replace wood and thus save millions of trees from felling. Use of uPVC in Door and Windows save trees for use in the vital building and construction sector. In recent years, multi-chambered window & door profiles sector has started growing because of the increasing awareness of energy and environment conservation. Many are highlighting the energy saving aspect of uPVC windows in their projects. Energy Conservation Building Code (ECBC) and Bureau of Energy Efficiency also appreciate the energy saving by using uPVC windows in place of

traditional metallic windows.

An International Conference on uPVC Windows, Doors & Profile Industry was organized by ZAK Trade Fairs and Exhibitions Pvt Ltd with Reliance Polymer as Knowledge Partner on the 10 December at MMRDA Exhibition Ground, Mumbai. ICPE participated in Panel Discussion on the topic uPVC Windows & Doors - products for green construction. The deliberations included the issues like -

1. Why does UPVC have to declare itself as the best framing material? Why does it have to always show an angry, aggressive face whilst other materials don't?
2. How is uPVC as a material green?
3. How will uPVC window contribute to a Greener India?

Energy saving pictures of uPVC window

Energy savings (uPVC) Windows vs. Aluminum Windows

	Energy Consumption - Embodied, extrusion & Heat Gain Frame		
	Embodied(Smelting to Casting) in kWh/kg	Extrusion in kWh/kg	Heat Gain-Frame (W/sq.m)
uPVC Window	20.12	0.65	12
Al Window	35.13	1.75	129



Al window



PVC window

Leads to energy saving in Air Conditioned/Cooled spaces

Energy saving by using uPVC window

Floor area – 1000 Sq. ft. & window area – 300 Sq. ft.

Initial Cost : Conventional Window- 175/Sq. ft.

PVC double glazed Rs 235/ Sq. ft.

Increase in initial cost Rs.18,000/-

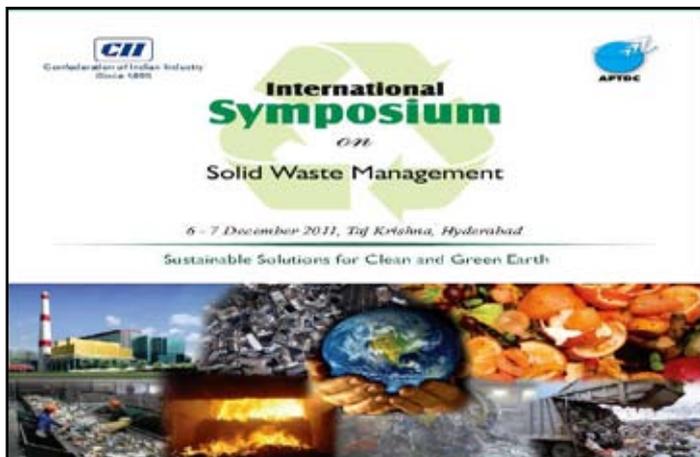
Power saving / annum by using PVC windows in place of Al – **4,369 units**

Total power savings - Rs 15,292 / annum

Case Study : IIT Delhi (PVC Windows)- 2003

...PVC profiles & Windows cut Air-conditioning cost

INTERNATIONAL SEMINARS



Confederation of Indian Industry (CII) and Andhra Pradesh Technology Development and Promotion Centre (APTDC) jointly organized **International Symposium on Solid Waste Management**, for finding sustainable solutions in Solid Waste Management.

This event of Solid Waste Management Symposium provided a platform for representatives from various Government departments, Entrepreneurs, Scientists, Research Scholars, Engineers, Subject Experts, University Students etc., to present and participate in the deliberations during the interactive sessions, exchange of knowledge and ideas.

The Symposium included discussions on practical challenges being encountered while implementing Solid Waste Management Solutions. The Symposium provided critical information on the subjects of deliberation. National and International Speakers from Government, Industry, Institutes, State and Central Ministers etc made presentations in various sessions as below:

- Municipal Solid Waste Management
- E-Waste Management
- Hazardous Waste Management
- Biomedical Waste Management
- Plastic Waste Management
- Construction & Demolition Waste Management

Mr. T. K. Bandopadhyay from ICPE made presentation on "Plastics Waste Management – Issues & Solutions" during the Symposium highlighting on the alternate technologies of recycling of mixed and commingled plastics waste already developed in some parts of the country.



The Indian Petrochem Conference has emerged as the annual focal point for a gathering of the global and Indian petrochemical fraternity, and an important event in the petrochemical industry calendar. **The Indian Petrochem Conference** offers focused coverage of the Indian and global petrochemical markets. In the past years the participants have been highly appreciative of the distinguished panel of industry speakers at this event.

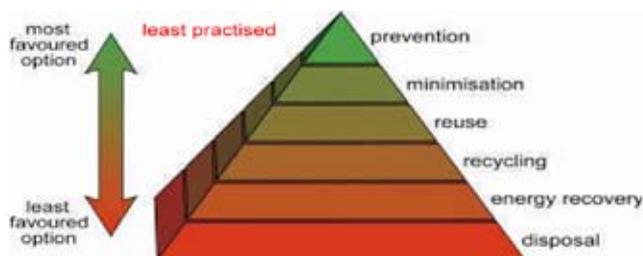
This year too the organizers had put together a vibrant program through the active support from the industry.

Asian economies continue to provide the growth impetus in a challenging global economic environment, volatile commodity and energy prices and rising inflationary pressures. Indian petrochemicals growth has continued its double digit trajectory and investment flows have intensified, largely from domestic companies and chasing domestic demand. China continues to invest heavily in the energy and petrochemicals chain.

The focus of the conference was the global petrochemicals markets, in particular the olefinic and aromatic chains, with a specific focus on India. This year's conference was focused on the downstream market growth and the opportunities for the commodity producers.

Looking at the growing National as well as International environmental concern on plastics, a major and important component of the petrochemicals industry, the organizers rightly thought it fit to include a detailed deliberation on environmental issues on plastics in its Agenda of Program. Mr. T. K. Bandopadhyay of ICPE was invited to make a presentation on Plastics Waste Management in Indian Context.

The specific issues on plastics waste management in India were highlighted and the technical solutions developed indigenously, were explained. This included formulation of the Indian Protocol on Co-processing of Plastics Waste in Cement Kilns, Development of methods for Using Plastics Waste in the Construction of Asphalt Roads and Conversion of Plastics Waste into Fuel. Full text of the presentation is available in ICPE web site.



AWARENESS CAMPAIGN AMONG THE PLASTICS RECYCLERS



Small Scale Plastics Recyclers of Dharavi Cluster with the Mumbai Corporator and UICT Professor

Among the different options of plastics recovery & recycling, **Mechanical Recycling** process is the most preferred one, due to its cost effectiveness and ease of conversion to useful products of daily use. The recycling process involves adequate cleaning and appropriate segregation of different types of plastics materials.

Major steps of plastics recycling operation are:

Collection → Identification → Sorting → Grinding → Washing → Drying → Agglomerating → Extruding / Compounding → Pelletizing / Granulation (Ready for moulding / extrusion to products)

The basic source of the input is waste stream and as the operation involves a major and important step of 'washing', the operator is required to ensure that the water used for washing is not discharged in to drainage system without proper treatment. On the other hand, if the plastics waste is not cleaned properly, it may cause emission of undesired volatiles during the extrusion process, apart from affecting the quality of product. Keeping the above in mind, Bureau of Indian Standards (BIS) has issued 'Guidelines' (IS 14534) for adopting appropriate procedures for recycling of plastics waste.

India has traditionally been recognized as one of the largest plastics recyclers in the world in terms of percentage of recycling to consumption of virgin plastics. Initially the driving force behind this has been economic compulsion for sourcing cheaper input, as virgin plastics raw materials were scarce and relatively costly in India. Now with the increase in plastics consumption and subsequent availability of the waste, plastics recycling is gradually becoming a sustainable commercial activity. However, it is reported that while recycling, many of the recyclers do not adhere to the Standard Guidelines prescribed by the authority.

Dharavi Cluster is well known as, among others, a major concentration for plastics recycling activities. To impart technical information on the importance of adhering to the Quality and Environmental Norms, MSME Ministry, Government of India entrusted University Institute of Chemical Technology, Mumbai for organising a Workshop for addressing the issues.

Mr. Vijay Merchant, Member – GC, ICPE and Mr. T. K. Bandopadhyay, Sr. Technical Manager-ICPE, participated in the Workshop and shared relevant technical information with Dharavi Recyclers and assured the organisers of any future cooperation.



ICPE ENVIS ACTIVITIES



ICPE ENVIS Centre has been selected as one of the active ENVIS Centres in the country. The Ministry has also enhanced the annual grant of the Centre in FY 2011 – 12. In line with the previously declared decision of the ENVIS Directorate of the Ministry, the web site of ENVIS ICPE has been redesigned. The restructuring of the newly designed web site has been uploaded and is in operational.

Ms. Kiran Budhiraja, Research Officer (EI) from the ENVIS Directorate of the Ministry of Environment and Forests had inspected the functioning of ICPE ENVIS Centre on 10th October 2011 and expressed satisfaction of the Centre's functioning.



Community Awareness Programme

Participation in community level events for creating Social Awareness is useful. ICPE had participated in an event **CELEBRATE BANDRA FESTIVAL** on 17th November, 2011, organised by the social organisations in Bandra locality of Mumbai, co-partnering with 'Jago Mumbai' – a Local Radio Network, for creating Mass Awareness among the general public on the social responsibility aspect of Segregation of Waste at Source for facilitating subsequent recycling of the Dry Waste. A similar programme by ICPE at the same venue during Environment Day celebration attracted the attention of the locals and they felt that there was a lot of misinformation about plastics not only among the general public but also in the minds of Municipality and other Maharashtra Govt authorities responsible for planning and governing Mumbai. ICPE had set up a KIOSK in the allotted promenade space of the Carter Road displaying posters and public awareness messages. Awareness films were also screened.



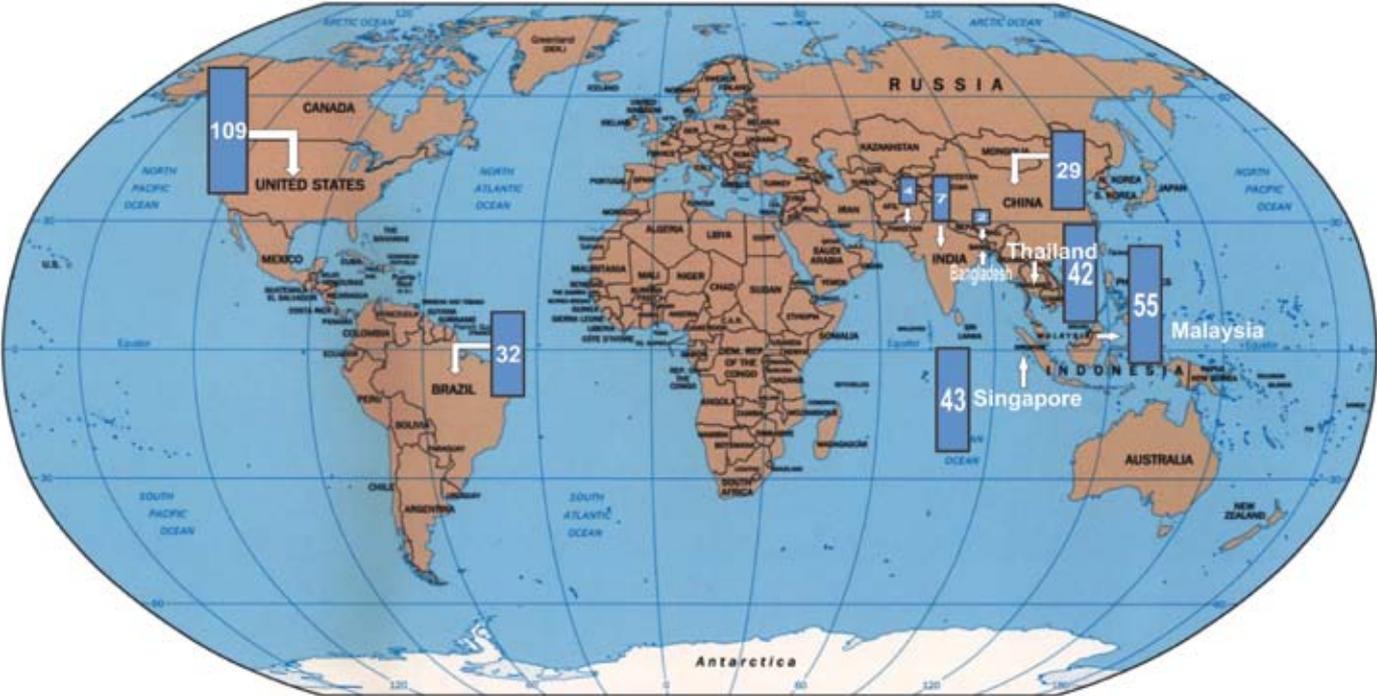
DATA SHEET

Per Capita Plastics Consumption in 2001 & 2010 (Kg)



Source : International

Per Capita Plastics Consumption of Select Countries for the Year 2010 (Kgs)



Source : Industry

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.

