IBHA PLASTIC WASTE MANAGEMENT PROJECT

Collection, Segregation and Reuse/Utilization of Post -Consumer Flexible Plastic waste to

- **Fuel oil**
- **As Fuel in Cement Factories**
- **In Road construction**

REPORT

01 December 2017

Table of Contents

Project Highlights

Highlights and the summary of activities of the IBHA project on Collection, Segregation and Reuse/Utilization of Post-Consumer Flexible Plastic waste to Fuel oil, As Fuel in Cement Factories and in Road Construction are given below:

- In 2013, IBHA conceptualized the PWM project and started a pilot in Mumbai with an agreement entered with Stree Mukti Sangatana, NGO associated with rag pickers and Rudra Environmental Solutions, Pune
- In 2014 the project was extended to other cities Chennai, Bangalore, Kolkata and Delhi
- Approximately 14 tons of Post-Consumer Flexible Plastic waste collected till date and 500 liters of fuel oil produced from the same
- In Bangalore and Kolkata, the Post-Consumer Flexible Plastic waste collected is used as fuel in cement industry (ACC Cements and Geocyle group)

IBHA

Background

Indian Beauty & Hygiene Association (IBHA), is the voice of the personal care products industry in India. As a trade association IBHA plays a pivotal role in regulating public policy through regular government interface thereby protecting the industry interests. Currently, IBHA has on its roster members representing big, medium and small-scale organizations. IBHA is registered as a non-profit organization under Sec. 8 of the Indian Companies Act 2013. There are 39 members on its roster, comprising of large, medium and small organizations. Companies like Hindustan Unilever Limited, Procter & Gamble, L'Oreal, Marico, Emami, ITC, Estee Lauder, Wipro, Johnson & Johnson etc. are some of the members.

IBHA Mission Statement:

"To accelerate the development of a trusted hygiene & beauty care industry that serves consumers with products that are effective, safe and environment friendly"

Formerly known as ISTMA (Indian Soaps and Toiletries Maker's Association), this Association was first established in 1937 at Kolkata. In 1973, it shifted its operations to Mumbai. ISTMA was later rechristened as IBHA in October 2012. Since then IBHA has had a rich experience. It has brought into focus several issues of critical importance to the industry starting with the government, during the pre-liberalization era and has kept the momentum going ever since. However, since the advent of liberalization, the regulatory environment has undergone a positive change with more emphasis being laid down to self-regulation.

IBHA's primary objective is consumer health and safety. IBHA's forte lies in providing technical perspectives on behalf of industry to the government - be it new regulations, amendments, technical issues related to cosmetics. In this way, it facilitates space for industry to create and deliver innovative products to consumers on a regular basis.

The Association is also firmly committed to corporate social responsibility via its two important initiatives which tackle:

- Plastic Waste Management
- Anti Counterfeits

Going forward IBHA hopes to become the most trusted Indian Cosmetic Industry Association of ensuring consumer protection and enhancing industry competitiveness. It is the Association's endeavor to build IBHA on par with International Cosmetic Industry Associations and be recognized on a global footing.

IBHA PLASTIC WASTE MANAGEMENT (PWM) PROJECT - HOW IT STARTED

In 2013, the Himachal Pradesh Government introduced a ban on plastic bags and non-biodegradable packaging. There were lot of discussions and debates on the harmful effects of plastics and whether collection and recycling/reusing flexible plastics is possible in a country like India which has a huge population. Some NGOs also started voicing their views against plastics especially Multilayered flexible plastics.

The collection of Multilayered flexible plastics is a major issue in a country like India since in many cities there is no proper segregation mechanism at house hold level and the consumer behavior to litter on the streets and public places being a major cause.

The ragpickers are also not keen to collect the multilayered flexible plastics, since it has no value for money and required a humongous physical effort to collect or segregate such MLP's. The rag pickers on the other hand felt it's easy to pick up rigid plastics, which has a better value for money and the collection/segregation is easier with less physical effort.

This gave the impetus and enough motivation to IBHA to work on this issue and come up with a viable solution to deal with both collection and reuse of Multilayered flexible plastics. IBHA has pioneered the vision of collecting back Multilayered flexible plastics and reusing them much before the Plastic Waste Management Rules of India are published in 2016 which also emphasized collecting back plastics post-consumer use and recycling.

The main aim or focus of the project is to demonstrate that the collection and multilayered flexible plastics is feasible in different cities in India.

PROJECT SCOPE AND DESIGN

IBHA conceptualized this project to incentivize the rag pickers for collection of Multilayered flexible plastics and then send it to a recycling facility to reuse or convert the MLP's into any other form like Fuel oil etc., IBHA's pilot project on Plastic Waste Management is a zero-waste project incentivizing rag pickers to collect multilayer flexible plastic wastes.

The scope of the project was limited only to the collection of Multilayered flexible plastics across all industry segments like food, cosmetics etc., and then reusing/reutilizing them. Rigid plastics like bottles are out of this project scope since there is already a workforce to collect and sell the same for a price. In addition, these plastic bottles are monolayered and can be easily recycled.

The project is designed in such a way that IBHA will work with the prominent NGOs across India which are into waste management. The rag pickers associated with these NGOs can help IBHA in the collection of Multilayered flexible plastics, IBHA in turn will incentivize the rag pickers based on the weight of Multilayered flexible plastics collected by them. While collection of MLP's is one challenge, its conversion or reuse is another big challenge. There are not many recyclers in the country who recycle the MLP's unlike rigid plastic bottles. Once the NGO is identified in a city the next step is to identify the Recycler who can convert these huge volumes of MLP's into useful products.

It was decided by the IBHA executive committee that this project will be first piloted in Mumbai and based on its success will be expanded to other main cities of India.

IBHA PWM PROJECT – THE TASK FORCE

In 2013, a taskforce was created for this IBHA pilot project comprising of prominent companies associated with IBHA in the FMCG sector like Hindustan Unilever, L'Oréal India, P&G, Johnson & Johnson, ITC, Godrej, Nivea, Emami and Marico.

One or more companies in the taskforce volunteered to adopt a city and work on the pilot project of collection and recycling of multilayered flexible plastics.

PILOT IN MUMBAI

In 2014, IBHA tied up with Stree Mukti Sangatana (SMS), an NGO organization that works actively with women rag pickers and the Municipal Corporation of Greater Mumbai.

About Stree Mukti Sangatana (SMS)

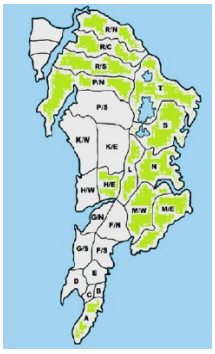
- It is an organization of Women rag pickers affiliated to *BMC*, involved in segregation and collection of garbage
- Areas covered: Colaba to Mulund, 13 wards
- BMC has provided them with 7 vehicles and 7 sorting centers in each 7 wards (Colaba, Bycula, Wadala, Chembur, Ghatkopar, Bhandup, Mulund)
- Each sorting center has 15 women rag pickers who segregate the waste and sell it to recyclers
- 1 Supervisor for the project
- SMS operate in 26 wards in Mumbai – 2500 women employed
- Paid per the amount/weight they collect, on per kg basis
    - Rs. 250 – Rs. 300 per day average income

Under Parisar Vikas Waste Management Program of SMS, 200 rag pickers are currently involved in this project and help to collect flexible plastic waste such as sachets and food packets.

The collected waste is sent to Pune based RUDRA Environmental Solution for recycling to Fuel oil by Catalytic Gasolysis Process.

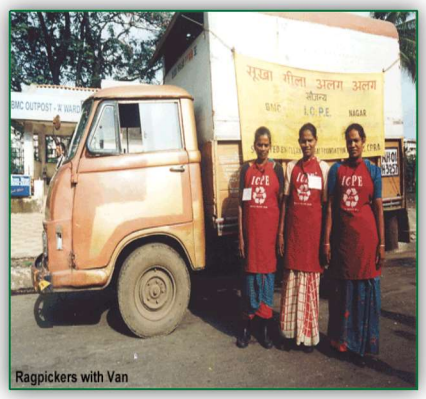
Areas covered

Collection started on 1st April 2014 in 4 wards namely Wadala, Govandi, Chembur, and Mulund. Out of the 26 wards, SMS started this collection now in 13 wards covering 235 housing colonies, 12 colleges, 10 hotels & 9 banks.



Till June 2016, SMS has segregated around 5 tons of waste to collect ~ 1.5 ton of flexible plastic waste and for every 100kg waste recycled 43 litres poly fuel generated by RUDRA.

Ragpickers at work


Ragpickers with Van


Dry Waste being carried for loading into Municipality Van


Loading of Dry Waste in Municipality Vans


Another view of Dry WAste segregation


Packing Of Segregated Dry Waste

The progress

2015: 200 women rag pickers incentivized at Rs. 10 per kilo; 7 municipal wards covered

2016: Incentives increased to Rs. 20 per kilo; Total waste collected: 1.5 tons; Total waste recycled: 665 kgs; Poly fuel produced: 310 liters.

To help the rag pickers to lead a healthy life, IBHA has conducted awareness sessions and health camps for rag pickers working for SMS. More than 4 Health camps and 4 Awareness Campaigns are conducted for SMS rag pickers. Awareness campaigns and brochures were also distributed.

RUDRA ENVIRONMENTAL SOLUTIONS

Based in Pune; Converts plastic waste into fuel oil by Gasolysis

Shredded Flexible PCU Plastics

Actual Plant of 200 Kg Capacity

Fuel Oil

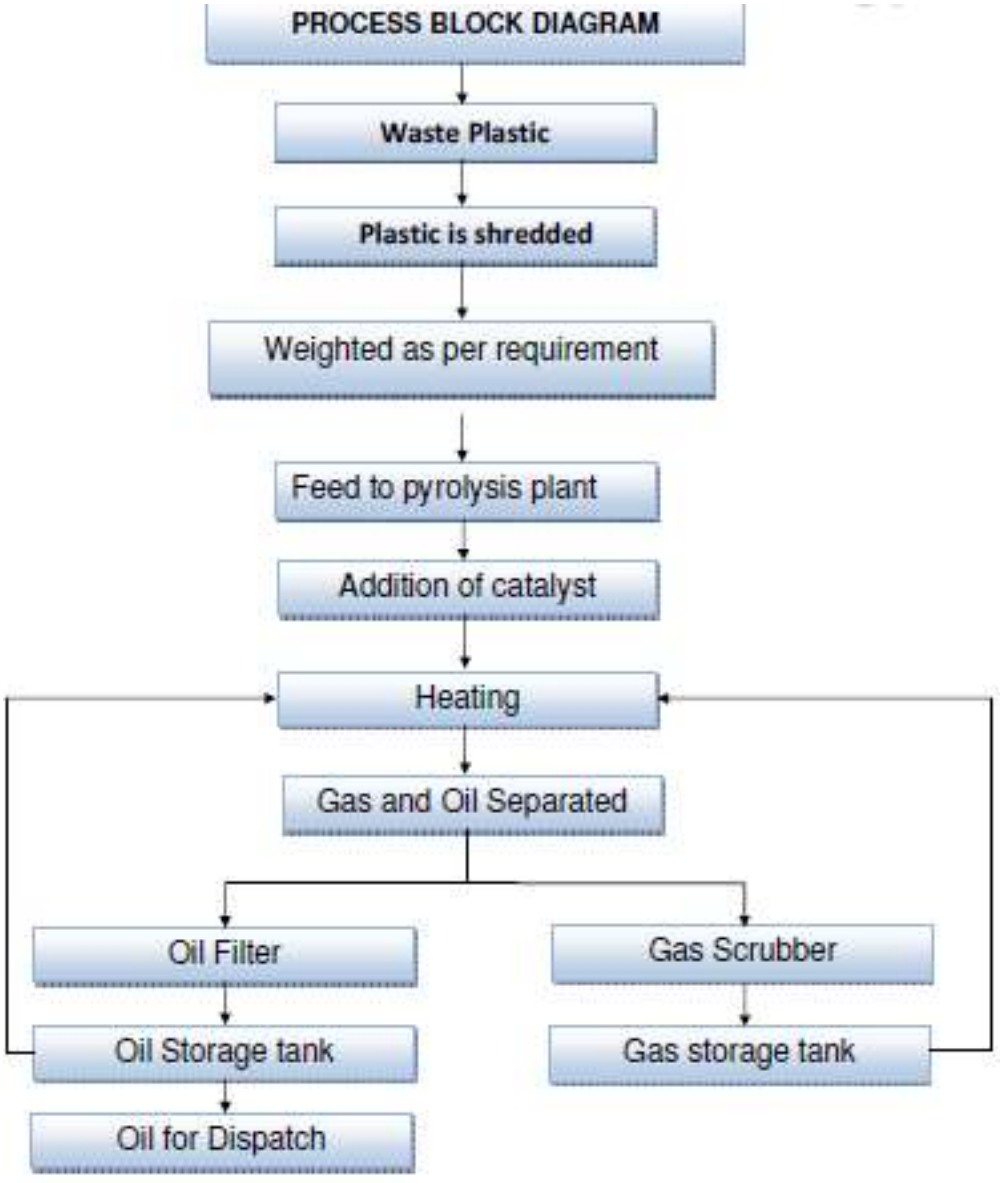
The poly fuel generated from this process can be used in gensets to produce electricity. This can also be used to light up local parks, street lights, light stoves. The polyfuel can also be used in Oil fired boilers, Incinerators, Furnaces, DG sets for power generation

Trials on using the poly fuel in other machinery are going on at present. Different size (from 200kg to 2000 Kg) plant which is easy to handle & manage. Cost: 50 kilo plant - INR 15 lacs; 200 kilo plant - INR 40 lacs; Batch timing: 3 hours; Cooling time: 3 hours

Sludge released as a by-product has a re-sale value of INR 100 per kilo; Batch Time / Operation Hours: 4-5 Hours per batch; Manpower/workers used for One shift is One helper and one operator.

Rudra Process

- Waste plastic is unloaded at site for Shredding, size of material is reduced
- Material is transferred to the Catalytic Gasolysis Reactor (selection of catalyst depends on the type of raw material used)
- The reactor operates at high temperature and in absence of air. The polymers are pyrolyzed to small chain hydrocarbon linkage.
- The vapors produced are condensed in the condensers and collected as crude oil.
- Non-condensable are then passed through scrubber for removal of gases. The Product Gas – Fuel Gas is then compressed and stored.



For more information on Rudra and their process, refer the brochure shared by Rudra Environmental solutions in the annexure at the end of this document.

PROJECT EXPANSION TO OTHER CITIES

Since the IBHA pilot project is successful in Mumbai, as planned we wanted to expand the scope of this project to other major cities in India. With the help of IBHA PWM task force members, we could identify key NGOs who are into Waste Management in Chennai, Bangalore, Kolkata and Delhi.

The NGOs and IBHA entered an agreement and signed MoU`s for collection and recycling the multilayered flexible plastics. City wise updates on the status of the project supervised by the respective task force members is given below:

Chennai

In Chennai, we have tied up with ExNoRa, an environmental and civic movement founded in 1988.They have successfully collected 1027 Kgs of Multi-Layer Plastics through rag pickers and handed over it to Paterson Energy limited, who converts these MLP's into fuel oil. The project report, acknowledgement copy from the recycler for the receipt of the material are attached in the annexure.

Bangalore

8.8 Tons of Multi-Layer Plastics was collected between Sep-Dec 2016 by Hasiru Dala, Bangalore based NGO. The collected waste was dispatched to ACC cements for processing/recycling, Certificate of Receipt and Co-Processing received from ACC cements. Refer the attachment in the Annex at the end of this document.


Bags of Multilayered flexible plastics collected by Hasiru Dala, before sending them to ACC Cements for processing:

Kolkata

2 Tons MLP waste is collected by an NGO in Kolkata called Narkeldanga Educational Environmental Development Society (NEEDS), which would then be processed by the Geocycle (cement industry) awaiting clearance from their legal team on this project & the agreement with NEEDS. Clearance expected this week, post which the agreement would be signed and NEEDS will send the MLP waste to Geocycle for processing.

Delhi

Pilot in Gurgaon completed. Approx. pilot qty ~ 10 MT collected. Report and more details on the project in this city is awaited.

Snapshot of the cities in which the IBHA pilot project on plastic waste management and the NGOs, Recyclers involved in the cities as well as the status is provided below for ready reference:

CITIES	NGO PARTNER + RECYCLER	Status
Chennai	**ExNoRa + Paterson energy Pvt. Ltd.**	• Project Report Submitted by ExNoRa. • 1027 Kgs of MLP collected and recycled to oil by Paterson Energy.
Bangalore	**Hasiru Dala + ACC Cements**	• 8.8 Tonnes collected between Sep-Dec 2016. • Dispatched to ACC cements for processing/recycling • Proposal from IshaFiber received and talks are on
Mumbai	**SMS + Rudra**	• Collection of flexible plastics and sending them to recycler RUDRA in progress • Awaiting information from RUDRA on state PCB clearance, consent to establish and waste (what is the yield) generated
Kolkata	**NEEDS + Geocycle**	• 2 Tons MLP waste collected • Geocycle awaiting clearance from their legal team on this project & the agreement with NEEDS. • Clearance expected this week, post which the agreement would be signed and NEEDS will send the MLP waste to Geocycle for processing.
Delhi/Gurgaon & Bangalore	SAAHAS + Bharti Cements + ACC Cements + Ultra Tech	10 tons each in Delhi and Bangalore collected and sent for recycling to Bharti Cements, ACC Cements, and Ultra Tech

ANNEXURE

1. Rudra Environmental Solutions – Brochure

Rudra Brochure - Feb 2017.pdf

2. Rudra Poly Fuel Test Report

RUDRA - Polyfuel Report.pdf

3. Certificate of Receipt and Co-processing by ACC Cements Bangalore

ACC cement - Recycler.docx

4. ExNoRa Project Report

IBHA Project Status Report - ExNora Che

5. Certificate from Paterson Energy Pvt. Ltd., Chennai

IBHA project Paterson Energy Pvt