Closing the Loop
Asia-Pacific Day for the Ocean

Reducing Plastics Pollution in India

Indian Centre for Plastics in the Environment (ICPE)
20\textsuperscript{th}, November 2018, Bangkok
Country Profile - India

- Second most populous country (1.35 Billion)
- Area ~3.0 million sq.km (8th, in the world)
- GDP at current prices ~USD 2.7 trillion
- Use of virgin plastic ~ 14 million tons
- Per capita virgin plastics ~10 kg (World average 46kgs).
- ~ 60% of plastics (~80% of PET bottles) recycled.
Solution to Plastics Pollution

Pursuit of Sustainability

focus on Circular Economy
Sustainable Development - Definition

“development which meets the needs of the present without compromising the ability of future generations to meet their own needs.”

... Bruntdland Report
Circular Economy - Definition

“Framework for an economy that is restorative and regenerative in design.”

... Ellen Macarthur Foundation
Circularity in Indian plastic industry
## Material Recycling Rates - Global

<table>
<thead>
<tr>
<th>Materials</th>
<th>Rates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iron &amp; Steel</td>
<td>70-90%</td>
</tr>
<tr>
<td>Paper</td>
<td>50-60%</td>
</tr>
<tr>
<td>Plastics</td>
<td>10-15%</td>
</tr>
</tbody>
</table>

## Energy Savings in Recycling

<table>
<thead>
<tr>
<th>Materials</th>
<th>Recycling Temperatures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aluminum</td>
<td>~ 660 °C</td>
</tr>
<tr>
<td>Steel</td>
<td>~ 1500 °C</td>
</tr>
<tr>
<td>Glass</td>
<td>~ 1400 °C</td>
</tr>
<tr>
<td>Plastics</td>
<td>~ 200 – 250 0°C</td>
</tr>
</tbody>
</table>
Recycling & Recovery Options - Plastics

Plastic Waste

Mechanical Recycling
- Different plastic products

Chemical / Feed-stock Recycling
- Conversion to monomers
- Pyrolysis - hydrocarbons

Energy / Material Recovery
- Incineration / Recover Energy
- Generating Electricity
- In cement kilns / blast furnaces
- Building Roads
India: Pioneer in waste plastics for bituminous road.

ASPHALT PLANT OF BMC, WORLI, MUMBAI

Prof. V S AGHASE ROAD DADAR, MUMBAI
Addressing Plastic Pollution in India

- **Cleaning India Movement** *(Swach Bharat Abhiyan)*
- **Regulatory Initiatives** *(Designing & Implementation of EPR)*
- **Formalizing informal waste management sector**
  - SwaCH (KKPKP), Pune
  - Indian Pollution Control Association, Delhi
  - Stree Mukti Sanghathan, Mumbai
  - Saahas Zero Waste, Bangalore
  - NEPRA, Ahmedabad
- **Appropriate technology to manage difficult to recycle waste**
  - Building Roads
  - Co-processing in Cement Kilns
Regulatory Landscape - India

• Plastic Waste Management Rules 2016, issued on 18\textsuperscript{th}, March’16 amended on 27\textsuperscript{th}, March’18
  • Local bodies to channelize recyclable plastic waste to registered plastic waste recyclers
  • Local bodies to create infrastructure for collection, segregation, storage, procurement, processing, transportation and disposal of plastic waste
  • Waste generator to minimize generation of waste and segregate at source.
  • Thickness of permissible plastic bags increased.
  • Concept of EPR introduced for brand owners.

• India pledged to abolish all “Single-Use” plastics by 2022
Regulatory Landscape – India (Contd..)

• State of Maharashtra issued notification “Maharashtra Plastic & Thermocol Products (Manufacture, Usage, Sale, Transport, Handling & Storage) notification 2018”
  • Prohibits use of few plastic products (plastic bags, cutleries, certain EPS products, disposable food containers..

• State of Uttar Pradesh bans plastic bags, disposable cutleries & select EPS products in phases from July’18.

• Bihar, Odisha, Tamil Nadu proposing / implementing ban on few plastic products perceived to be problematic.
  • The list varies from state to state but Plastic carry bags are included in all these initiatives

• Few other states had earlier restricted the use or banned plastic carry bags in past.
Conclusions

- Enhancing circularity imperative to fight against pollution.

- Compared to alternatives, plastics are relatively new (50-70 years vis-à-vis hundreds of years for metal, glass and paper).

- Societies are on learning curve in their usages, handling & disposal.

- Plastics typically have lower material, energy and water footprints.

- Advanced economies have derived the benefits with better waste management policies & practices.

- Eliminating use of few plastic products may not achieve desired results.
**Indian Center for Plastics in the Environment**

- Established in Jan’99 on recommendation of task-force constituted by Ministry of Environment, Forest and Climate Change, Govt. of India

- Non-profit organization supported by the industry.

- Involved in providing technical inputs to policy makers, regulators and industry.

- Support development of technology (Use of plastic waste road construction, co-processing in cement kilns, pyrolysis to liquid and gaseous energy products)

Thank You