



## SUMMARY RECORD

MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE – OECD – GIZ – CPCB

INTERNATIONAL WORKSHOP ON EXTENDED PRODUCER RESPONSIBILITY IN INDIA:  
OPPORTUNITIES, CHALLENGES AND LESSONS FROM INTERNATIONAL EXPERIENCE

May 12-13, 2016

Juniper Hall, India Habitat Centre, New Delhi, India

### Background and objectives

Extended Producer Responsibility (EPR), an environmental policy that extends the responsibility of producers to the post-consumer stage of products, are now widely used and virtually all OECD countries, plus a number of emerging market economies apply them to foster material recovery from waste, including for e-waste, packaging, tyres and end-of-life vehicles.

In India, the concept of EPR has been part of the legislation on e-waste and plastic waste management since the year 2011, when E-waste (Management and Handling) Rules and Plastic waste (Management and Handling) Rules were notified. Following this, the Government revised and updated these rules in 2016, further emphasising the implementation of EPR. In addition, the possibility of EPR based policy on end-of-life vehicles is also beginning to be discussed.

The Organization for Economic Co-operation and Development (OECD) recently completed an update of its guidance on extended producer responsibility, which draws together some of the key lessons that have been learned from OECD and a number of emerging market economies.

Against this background, the objectives of the workshop were:

- To assess the opportunities and challenges for implementation of EPR in India;
- To share OECD experience on the design and implementation of such schemes in developed and developing countries with policy makers and stakeholders in India; and
- To develop policy recommendations through a consultative process with the stakeholders.

This workshop was co-organised by the Ministry for Environment, Forest and Climate Change (MoEF&CC), the Central Pollution Control Board (CPCB), OECD, and the BMUB-funded GIZ-Project 'Resource Efficiency and Management of Secondary Raw Materials', and with additional financial support from the European Union.

The event brought together about 150 professionals from the Indian Government, private sector and NGOs, plus a number of international experts from Switzerland, Brazil, Bulgaria, The Netherlands, Japan, the OECD and GIZ.

### Summary of discussions

#### *Opening session*

The workshop started with an opening session where several high-level participants provided their views on how the topic of extended producer responsibility fits into the broader political and environmental context. Secretary for Environment, Forest and Climate Change, Mr A. N. Jha, Additional Secretary Dr

M.M. Kutty and Joint Secretary Mr B. Sinha, provided some background to the relevance of EPR in India. They pointed to the current weakness in waste management at the level of local communities and the significant role that is played by the informal sector in this area. In this context EPR presents the opportunity of integrating end-of-life management costs into market prices, providing a stable source of funding, as well as the possibility of developing infrastructure and higher levels of awareness in the population. E-waste and plastic waste are two areas where India's current EPR policies focus and both policies have been recently updated to support the achievement of environmental objectives. Some of the key challenges that India is meeting include the large informal sector that is largely below the radar of administrative services by definition, as well as administrative, economic and technical issues that are linked to the implementation of the current EPR rules. While international experience is of great interest to India, it is unlikely that this can be transposed one to one, but adaptations to the Indian context will be needed.

OECD Head of Division, Dr Shardul Agrawala, highlighted that among the 400 EPR schemes existing worldwide, 70% of them emerged since 2001, and this recent development in EPR schemes has led to a recent update of the OECD 2001 policy guidance on EPR. Many OECD countries have developed EPR schemes in key sectors such as packaging, electronics, batteries and vehicles. The spread of EPR schemes beyond OECD countries has made it relevant for the OECD to address the different policy context for EPR in emerging and developing countries. The informal sector, for example, which was not addressed in the 2001 guidance is now featured in the updated guidance. The evolving global context on EPR and the increased inter-connectiveness between developed and developing countries need to be considered in establishing such schemes. A global consultation process held in Tokyo in 2014, has in part fostered further cooperation on EPR between the OECD and emerging economies including China and India, and has led to an opportunity in having this workshop.

Deputy Ambassador of the EU Delegation in India, Mr C. Onestini, pointed to the relevance of EPR in the context of the EU's efforts for a transition towards a circular economy. A circular economy package, containing an action plan, was presented by the EU Commission at the end of 2015 and is now being consulted by the EU Institutions. EPR provides a key policy instrument in this context and the circular economy action plan contains some guidance for its implementation in Member States. More broadly, cooperation in the area of the circular economy has also been a subject of the recent EU-India Summit that took place in February 2016.

GIZ Programme Director, Mr F. Samol, pointed to the timeliness of the workshop, given the recent updates of e-waste and plastic waste management rules in India. GIZ sees EPR as a key policy instrument in the transition towards sustainable materials management and Germany, as an early adopter in this area, has a lot of relevant experience to share. A key focus of GIZ's cooperation with India has been focused on the challenge that is represented by the large informal sector in this area. More generally, resource efficiency is a focus for GIZ's cooperation with India, and the recent establishment of the Indian Resource Panel has been supported in this context and should provide relevant analysis going forward.

### *Session 1: Extended Producer Responsibility – Setting the Scene*

This session provided an overview of the key issues on extended producer responsibility and was kicked-off by a keynote presentation from Dr Shruti Rai Bhardwaj, Joint Director at the Ministry of Environment, Forest and Climate Change, who introduced the recently updated e-waste management rule. The new rule aims to address a number of challenges that were identified with respect to the initial rule that was issued

in 2011. These challenges included a loophole that was due to the exemption of micro- and small enterprises, the fact that financial mechanisms were not elaborated, EPR authorisation that had to be obtained at the State level, a lack of awareness and capacity development initiatives by producers, along with a number of other issues. The updated e-waste rule now provides a target-based approach which leaves more flexibility in the implementation of EPR; it allows a variety of different ways through which EPR can be implemented, including deposit/refund, Producer Responsibility Organisations (PROs) and e-waste exchanges; reduces the exemptions from the system to micro-enterprises; provides for a pan-India authorisation, plus a number of other improvements. A number of guidelines, including for EPR authorisation and target calculation, as well as capacity development and awareness raising initiatives are now under development to further support the implementation of the updated rule.

Mr Peter Börkey, Team leader Resource Productivity and Waste at the OECD Environment Directorate, presented OECD's recently updated guidance on EPR. This was elaborated over a period of several years and involved a range of stakeholders in OECD and emerging market economies. Overall, the experience with EPR is positive, as it has generally led to an increase of separate collection and material recovery, generated necessary financial resources and created new and large market for recycling and recycled material. The guidance focuses around four main issues: EPR governance, competition, incentives for design for environment and the role of the informal sector. Some of the highlights of this work include the need for strong government involvement and oversight of EPR, independently of which model of EPR is chosen (i.e. private sector or government-run, competing or single PRO). Governments need to enforce environmental standards and a level playing field for all actors in the market, as well as a high level of transparency. OECD experience also shows that EPR can affect competition in various ways, making a competition review a useful pre-requisite in the process of designing EPR. Full cost recovery from producer fees and the use of variable, possibly modulated fees (according to product design) help to strengthen incentives for more environmental product designs. The informal sector is both a challenge and an opportunity and ideally EPR should be designed in a way that includes informal operators into the system, unless there is a risk that the system might be undermined by them.

Mr Thibault Devanlay from the EU Delegation in India, presented a set of general requirements for EPR that are part of the circular economy action plan that is now undergoing consultation in the European Union. They point to the need to clearly identify the roles and responsibilities of different stakeholders; to define measurable waste management targets and establish a reporting system; to establish producer responsibility organisations according to a number of principles; to ensure that the necessary financial resources are generated from producers, including through the recovery of the full costs through producer fees; and to establish an adequate monitoring and enforcement system. These minimum requirements are meant to support some harmonisation, as well as performance improvements of EPRs across EU Member States, where significant disparities have been observed in the past.

Ms Ellen Günsilius presented the German Development Cooperation's (GIZ) activities in the area of extended producer responsibility, including from projects in Tunisia, Algeria, Ghana, Chile and Egypt, where it is facilitating information exchange and providing policy advice. More specifically GIZ support has focused on providing advice for the financial and logistical set-up of EPR systems, on helping SMEs comply with EPR requirements and on establishing producer/product registers and monitoring systems. These activities take place in the framework of GIZ's global sustainable waste management project, which covers issues related to marine litter with a focus on packaging waste, as well as e-waste management.

Mr Anwar Shirpurwala from the Manufacturer's Association of Information Technology (MAIT) discussed some of the key challenges in implementing EPR for e-waste in India. These challenges include

the issue of ownership of waste and how to get it back from consumers when end-of-life devices still have economic value; and the difficulty of achieving relatively ambitious collection and recycling targets that are enshrined in the e-waste rule. In order to address these challenges the industry is focussing on bulk customers in a first step, by including dispositions on the management of devices at the end of life into customer contracts; and the roll-out of an awareness programme that will involve producer responsibility organisations. The presentation also pointed to the need for further guidance from government on the way producer responsibility organisations should be set-up and a suggestion was made to develop a government-private sector partnership model for this purpose.

Mr Ravi Agarwal presented Toxics Link's views on extended producer responsibility. These schemes are perceived as an opportunity to move from an end-of-life approach to one that focuses more on waste prevention, and they are a tool to formalise the now largely informal waste sector by providing financial resources and operational and environmental standards to the sector. Some of the key success factors include adequate monitoring and auditing of EPR, tight financial management and the acceptance of EPR by producers. In all these areas, India would need to make progress in order to better implement existing EPR rules. The informal waste sector is another challenge and the success of EPR depends on the ability to formalise and integrate these actors into the system. There is positive experience with doing this in Kolkata for some of the larger informal operators, but it appears to be difficult for the very small ones, and it is a time consuming process. It is suggested to establish an information exchange platform in order to share experiences with countries in Africa, Asia and Latin America, where relevant positive experience exists.

In the ensuing discussion participants expressed concern with the absence of good data, a key requirement for the implementation and enforcement of EPR, which is also in large part linked to the dominance of informal operators in the waste collection and recycling market, which by definition escape official data. Another key concern related to the difficulty of accessing waste products and material from consumers and informal collectors and recyclers. Producers and producer responsibility organisations may need to pay to attract end-of-life products into the formal EPR system. Finally a number of participants pointed to the need for better enforcement of environmental standards in order to support efforts for the formalisation of the waste management sector.

## *Session 2: EPR for better e-waste management*

### *Part 1: Collection and recycling capacity and the role of the informal sector*

Mr Ajay Tyagi, Additional Secretary, Department of Economic Affairs, Ministry of Finance chaired this session and introduced this item by emphasising that the informal sector cannot be ignored and it can provide significant opportunities for better management of EPR systems.

Dr Flavio De Miranda Ribeiro, from the São Paulo State Environmental Agency (CETESB), Brazil, presented São Paulo State's experience on EPR, the role of informal sector and approaches for the integration of waste pickers into formal waste management. The key message conveyed was that waste pickers are fundamental actors in Brazilian waste management and they need to be a part of the EPR systems as official stakeholders. Social inclusion needs to be assumed as a public policy objective and this should be realized by organising and registering waste pickers in cooperatives. Through examples of a few cooperatives, a number of challenges were identified. First, the intrinsic value of materials is usually not enough to promote social inclusion. Second, most cooperatives do not have sufficient capacity to adequately deal with e-waste, and as a result, environmental permits are indispensable for dismantling and further processing, while training, equipment, and technical support is also required.

Dr Sandip Chatterjee, Director & Scientist 'F', Department of Electronics & Information Technology (DeitY), Government of India, presented the role of the informal sector for effective EPR in the context of India. DeitY's initiative on e-waste recycling is to deploy cost effective processing technology of electronic waste recycling. In his presentation, it was highlighted that 90-95% of e-waste is recycled in the informal sector whereas 5-10% e-waste is recycled in the formal sector. In India, there are issues with the informal sector where they use primitive methods to remove components and valuable metals. This promotes leaching of heavy metals and hazardous chemicals into landfills and incinerators, and recovery rates are poor (10-20%) losing precious metals. In addition, printed circuit board (PCB) treatment is limited domestically and is frequently exported for further processing and recovery of precious metals. The strength of informal sector includes high collection rates where around 95% of generated e-waste is being processed through highly sophisticated collection methods such as reaching from bulk generators to households through a door-to-door collection network. Key challenges of the informal sector include; inadequate facility and working environment; employment of crude method for extraction of the metals which can cause leaching of toxic materials in the environment; and the difficulty to channel the waste to the formal sector.

Following the 2 key note speakers, 4 panelists presented their views in the stakeholder roundtable. First, Dr Rachna Arora, of GIZ, presented experience on the integration of the informal sector from 5 Indian cities. She indicated the diversity of the informal sector and the different approaches taken towards their formalization, such as a cooperative led model (Ahmedabad, Delhi and Pune) and a NGO led model (Bangalore and Kolkata). She also emphasized the importance of up-scaling these initiatives through recognition, government support and public private partnerships.

Second, Mr Shunta Yamaguchi, of the OECD, presented the informal sector chapter of their updated guidance on EPR. He indicated that the informal sector can provide positive economic and environmental impacts through collection and sorting, however unsound practices such as informal processing of waste need to be eliminated. There is increasing evidence that the failure to include the informal sector into EPR can undermine the system, such as in the case of Bulgaria. For an inclusive approach, there is a need to register waste pickers and to work towards formalisation and professionalization, as well as to engage them in the policy dialogues, as seen in Brazil and Colombia.

Third, Ms Radhika Kalia, Consumer Electronics and Appliances Manufacturers Association (CEAMA), presented the industry perspectives on EPR and the informal sector, and mentioned that the new rules will encourage producers to work closely with the informal sector to meet recycling targets. However, this will come with a very high cost on top of the EPR recycling costs. There are still questions on how to engage with the informal sector while meeting ambitious recycling targets and how to build the additional costs into the product cost structure. The informal sector is currently dominating e-waste collection and processing, hence, there is a need to better understand how to approach them from the industry.

Mr Vinod Babu, Additional Director, Hazardous Waste Management Division, Central Pollution Control Board (CPCB), Government of India presented their perspectives as a regulator on the implementation of EPR and the informal sector. He indicated the number of formal recycling facilities in India has increased from 33 in 2010 to 148 in 2016, however, these facilities are not distributed uniformly across the country and are struggling to secure e-waste where it is competing against the informal sector. There are additional concerns in recovering high quality material in compliance with environmentally sound practices when the informal sector is involved in processing printed circuit boards (PCBs). This is because the majority of PCBs are exported abroad for further material recovery whilst environmentally polluting processes are used when they are carried out domestically.

The ensuing discussion focused on the leakage of e-waste to unauthorized informal facilities and how to regulate their activities. For instance, if informal recyclers decide to go beyond their current practice of collecting and dismantling waste towards processing for further material recovery their activities need to be strictly monitored to ensure environmentally sound management of waste. In this regards, the difficulty of data availability about the informal sector was also raised as an issue. Other comments focused on the

general implementation of EPR policies typically on the issue of visible fees which are being considered at the federal level in Brazil in response to a business request.

*Part 2: Target setting and financing in the context of EPRs*

Dr Shardul Agrawala, OECD Head of Division, chaired this session and mentioned the importance of target setting and financing of EPR schemes while highlighting some of the related challenges such as the issue of orphan products and free riding.

Dr Yasuhiko Hotta, Institute for Global Environmental Strategies (IGES) of Japan, presented international experience from Asia and the Pacific to better finance EPR systems. The motivation of adopting EPR policies are different, where developed countries usually introduce these systems for shifting financial and physical responsibility for treating waste from local governments to producers, developing countries usually introduce EPR systems to establish proper treatment and recycling routes. In the case of Japan, recycling targets are set by the government and reviewed every five years, while recycling fees are set by the manufacturers. Necessary infrastructure was developed by parallel efforts through government subsidies and policy finance schemes to establish recycling industries and to develop the nation's recycling capacity. In setting up proper targets and financing schemes, the involvement of relevant stakeholders including manufacturers, retailers, recyclers and experts into the process of establishing governance mechanisms such as planning, decision making, monitoring and reviewing is the key for the successful implementation of the EPR system.

Dr Ashish Chaturvedi, from Adelphi Research, presented target setting and financing of EPR systems in the Indian context. He mentioned that EPR and waste management in India are not only about environmental perspectives but also involve multiple issues such as social and cultural aspects where the informal sector could be better addressed in a broader context. Experience from the 2011 act on e-waste management suggests that a mandatory take back system without recycling targets has been struggling to attract appropriate financing and investment to the sector and this has been addressed in the 2016 rules. Financing of the EPR systems would need to cover costs for collection, transportation, dismantling, recycling, disposal, and system-setting expenses such as awareness raising and capacity building. Given the dominating informal sector which currently collects up to 95% of end-of-life products, a price support mechanism based on deposit refund systems could be proposed which uses the value of e-waste exchanged in the informal market as a benchmark. 4 principles were recommended for the successful implementation of the EPR system; rational cost recovery, visibility of fees, transparency, and multi stakeholder governance.

The following 3 speakers were invited for the stakeholder roundtable. Dr Anand Kumar, Additional Director, CPCB, presented their perspectives as a regulator. CPCB is currently producing guidelines for collection targets, which will be imposed to producers based on the quantity of products placed on the market and the expected product life. The collection targets will be 30% in the first two years, 40% for the 3<sup>rd</sup> and 4<sup>th</sup> year, 50% in the 5<sup>th</sup> and 6<sup>th</sup> year, and 70% in 7<sup>th</sup> year and onwards. He pointed to a concern about the extended life of electric products where these pass through multiple lifecycles before end-of-life disposal in the Indian context. He also raised issues in identifying the best method for verification of the producer compliance in meeting these targets.

Mr Pranshu Singhal, Indian Cellular Association (ICA) shared perspectives from the industry. The biggest issue that will be faced is enforcement mechanisms and free riding. There are currently 10,000 producers in the Indian market and 2-3,000 brands for cellular phones, which are all subject to the implementation of the EPR system. However, the current system is not designed to engage with all these producers where the burden may be shouldered by a few visible entities. He also raised concerns in meeting collection targets where currently 90% of end-of-life products are ending up in the informal sector.

Ms Priti Mahesh, Senior Programme Coordinator, Toxics Link shared views from the civil society perspective. She called for a level playing field for producers to comply with EPR systems where

enforcement mechanisms will play a key role. If sanctions are not imposed and actions are not taken, free riders will dominate and a small amount of producers will keep bearing the cost. Therefore, improvement in transparency and monitoring systems will play an essential role.

In the discussion that followed, there were many questions related to the start-up phase of the EPR system on how producers are identified, how the compliance of targets would be verified, and what an EPR plan from a producer actually looks like. Moreover, concerns were expressed on the challenge of ensuring a level playing field and avoiding free riders as well as cherry picking which was highlighted by all stakeholders. International experience suggests that stakeholder dialogues and starting small with few target appliances are extremely important elements in the process of developing EPR systems and setting meaningful targets.

### *Session 3 EPR for packaging: opportunities and challenges*

Dr M.M. Kutty, Additional Secretary of MoEF&CC chaired the session on EPR for packaging. In his introductory remarks, he mentioned that India introduced plastic waste management rules in 2011, and published a revised rule in April 2016 with EPR principles that require producers to collect, sort and recycle plastic waste in an environmentally sound manner. The key driver for the adoption of this policy is to address the exponentially growing packaging industry and to divert plastic waste from landfilling and littering to recycling.

The first key note speaker, Dr Prodipto Ghosh, Distinguished Fellow of The Energy and Resources Institute (TERI) presented the opportunities and challenges for EPR and packaging in India. He mentioned that waste management is about setting up facilities to treat the waste, and diverting waste from the wrong place to the right place to prevent littering and to re-produce useful products. This all comes with a cost, and there is a question on the most optimal way and institutional set up to manage this process. This societal cost has to be covered by someone. There are two ways in organising this. First, governments can fund, manage and impose a tax on to the citizens. However, this is not the most efficient way because it is not necessarily the person who is polluting who is paying. Second, EPR is an alternative instrument where the person who is placing the waste in the wrong place is directly held responsible. There is an important question on how this will be applied in the socio-economic context of India where the “Kabaddiwala” (informal) system has long existed from the past, however, will be held illegal with these new rules. The integration of the Kabaddiwala (informal) system into the formal systems through formalisation and professionalization is a key element for the effective implementation of EPR schemes.

Dr Marco Buletti, Federal Office for the Environment (FOEN) from Switzerland, as a second speaker, presented international experience for EPR and packaging. He first pointed to the diversity of EPR systems where similar performance levels can be reached by very different systems (e.g. mixed collection of recyclables in the German case versus separate collection of recyclables in the Swiss case). He also suggested EPR schemes should be tailored made to adjust to local situations. In the Swiss context, a range of flanking policies provided incentives for the implementation of EPR systems, including markets for the recyclables, landfill taxes and “pay as you throw” systems where households are charged by the volume or weight of non-recyclable waste. For the design of EPR schemes, financing at the source was also emphasised as an important element, where producers should be held responsible to bear the cost. For the implementation of these schemes, controls, reporting and statistics were highlighted as important elements, and typically, the reporting needs to be easy for all stakeholders. It was made clear that financing systems need to be transparent, easy and controllable with clear roles and responsibilities. Dialogue with the stakeholders was also emphasised as an important measure to achieve a common understanding of the

objectives of the scheme. Finally, EPR schemes may need to evolve when circumstances change, such as under increasing volatility of commodity prices.

The third key note speaker, Ms Monika Romenska from the Extended Producers' Responsibility Alliance (EXPRA), presented insights from the private sector into packaging EPR. From the perspective of a producer responsibility organisation (PRO), she highlighted that roles and responsibilities should be clear between the different stakeholders, including national and local authorities, obliged industry, recycling industry, PROs, consumers, citizens, and waste pickers. Regarding the design of the EPR schemes, different approaches are taken in EU countries, such as single or multiple PRO, shared or parallel collection infrastructure, and full or shared cost approach, but no preferable approach could be identified and adjusting to the local context is a key success factor. Several challenges were highlighted in the implementation stage, such as issues of free riders, excessive competition between PROs, and insufficient interest among stakeholders. Several core principles were shared where; different stakeholders should have clear roles with no conflict of interests; separate collection and collection infrastructure for inhabitants is key for the success of the system; transparency of operations and data is ensured; fees for all materials covered should be calculated in a fair manner; PROs should control the use of the fees collected; and design-for-recycling and clear communication and education of company representatives and inhabitants are essential. The speaker also made recommendations for PROs including; clear understanding of legislations; define role of the organization; make operational choices; collaborate with local authorities; develop solid marketing and communication strategy; develop efficient, transparent and reliable data management systems; keep costs under control and balance costs with income streams.

The final key note speaker in this session, Ms Wilma Rodriguez, from SAAHAS, a social enterprise in Bangalore presented their domestic efforts in treating packaging waste. SAAHAS started off as an NGO in 2001 after the municipal solid waste rules came out in 2000, however was transitioned into a social enterprise in 2013 as a business model after acknowledging the need for a shift towards professionalization of the whole waste management approach. They work with bulk waste generators (including Tetra Pak and Coca Cola India), and collecting and sorting waste by mobilizing 150 waste pickers and informal workers. These workers are given social security and minimum wages towards the aim of formalisation. Their current capacity as of 2016 is 20 tonnes of waste per day, with an aim of scaling up to 300 tonnes in the next 3 years. Materials are sourced in cooperation with bulk waste producers, material recovery centers, municipal collection, door-to-door collection and informal sectors including waste pickers and scrap dealers. Scaling up is key to work more with the informal sector and taking them to the next level as well as increasing the waste collection and sorting capacity towards the municipal levels (Bangalore currently generates 4,000 tonnes of waste per day). In this process, the introduction of EPR is an opportunity to clean up, as well as providing livelihoods to the informal sector towards formalisation and professionalisation.

Following the keynote presentations, 5 panellists were invited to the stakeholder roundtable. First, Dr Indrani Chandrasekharan, Former Advisor Planning Commission & Director, MoEF&CC shared her views on EPR. She mentioned that EPR has increasingly been adopted as a strategy to re-direct material flows rather than emphasising their use in new and innovative products. She introduced new technologies such as PET to textiles, mixed plastic waste to wood like products, wood dust and mixed plastic waste to wood products, and road construction applications that could be explored in the future.

The second panellist, Mr Jeff Fielkow, Cluster Leader Environment for South Asia, East Asia & Oceania from Tetra Pak, shared perspectives from the private sector. He raised several key points for the successful

implementation of EPR schemes, including clearly defined roles and responsibilities, legislation and enforcement, and the inclusion of all packaging to ensure a level playing field and economies of scale. He also mentioned the importance of the government in setting the ground rules.

Mr Sanjib Bezbaroa, the Executive Vice President of ITC Ltd., presented insights from a domestic enterprise perspective. ITC, in part, produces packaging for parcels and agri-products as well as products that use packaging. They also have provided active solutions on municipal solid waste management for the last 15 years. Concerning the magnitude of waste issues in India, 62 million tonnes of municipal solid waste is generated per year, which is not segregated and 80% goes to landfills filling up 1240 hectares of land per year. Despite this challenge, their experience from Bangalore shows that, segregation of waste at source can be as high as 80% after two years of engagement with stakeholders. Once this segregation occurs, around 40% of the municipal solid waste is inert (e.g. sand and ash), 42% is wet organic waste, 8% is glass-metal-wood, 6% of paper, and 4% of plastics. He suggested that segregated plastics could be improved and engineered again as plastics; low value plastics which have quality issues could be sent to cement kilns for replacement of fuel, and the wet organic waste could be utilised for bio-methanation at an industrial scale. To this end, he called for public support towards energy recovery solutions.

Mr N. Muthusezhiyan, Principal Counsellor, Confederation of Indian Industry (CII), presented experience with the Sustainable recycling industry (SRI) project that is jointly implemented with the Swiss government. He indicated that 30% of e-waste consists of plastics among which 70% are high quality plastics and the remaining 30% is contaminated with brominated flame retardants (BFRs) and heavy metals. The informal sector, who is collecting 90% of e-waste, does not segregate high quality plastics and the contaminated plastics leading to a loss of high quality material. Therefore they are aiming to identify cost-effective methods to segregate the contaminated plastics and have a separate disposal mechanism so it will not enter the recycling chain.

Finally, Mr Mani Vajipey, CEO, Banyan Nation Recycling, presented perspectives from a start-up recycler. He mentioned that collection and transportation of waste is not a problem due to the largely developed informal sector network. However, he raised concerns over the poor recovery technology deployed in the informal sector where closing the loop of the value chain of materials is currently difficult. In order to shift to modernised technology as well as compliance with environmental and labour standards, he called for the necessity of a level playing field.

The subsequent discussions focused on the role of the government to facilitate the start-up of PROs, and the ways to deploy visible fees to different product groups, where legislations indicating clear roles and finance guidelines, as well as stakeholder dialogues were identified as a key measure. Other questions focused on how the invaluable fractions of waste should be treated and balanced with valuable fractions of waste in the system. The experience from Switzerland suggested that the system changes accordingly to best address the problem and it has evolved from voluntary to mandatory schemes and setting criteria by weight. The Indian government is also approaching this issue by increasing the minimum thickness of plastic bags to 50 microns to enable them to be collected and recycled. Another comment was raised on the challenge of pursuing multiple objectives (e.g. environmental objectives, social objectives, economic objectives) through a single policy instrument. Although EPR policies are cross cutting, they need to be established on available structures and need to incorporate the informal sector.

*Session 4 Opportunities for expanding EPR: End of life vehicles*

This session was introduced by the Chair, Mr A. K. Mehta, Chairman of the Central Pollution Control Board, who pointed to the exponential increase in the use of resources in India's transport sector and ongoing efforts in the government, supported by GIZ, to develop a new scrapping policy for end-of-life vehicles, where an EPR could well fit. One of the challenges, as in other sectors, is that most of the recycling is presently done by informal operators.

Mr Herman Huisman, Ministry of Infrastructure and Environment of The Netherlands, presented the functioning of the Dutch EPR on end-of-life vehicles, which is organised through ARN, a producer responsibility organisation. ARN was created to replace a dysfunctional system that operated through about 2500 recyclers, many of which sub-standard operators. Following the introduction of ARN, the sector consolidated to about 250 recyclers. ARN collects a fee from producers (currently at 45 EUR per car) and ensures that collection and treatment take place in one of the certified recycling facilities. End of life vehicles that are treated through ARN feature a reuse and material recovery rate of 86%, while about 10% goes into energy recovery. A key to the success of the approach is its linkage to the system of car registration, which ensures that the annual road registration fee that motorists have to pay is discontinued only if the car has been dismantled properly. This discourages illegal dumping or dismantling by non-certified recyclers.

Ms Mita Sharma, Central Pollution Control Board, presented the current situation of end of life vehicles management in India, which was the subject of a recent study developed jointly with GIZ. The sector is heavily dominated by informal operators that account for about 90% of the activity, most of which do not conform to environmental or social standards. A key challenge is therefore represented by the need to transition from a largely informal recycling sector to a formal one and EPR is a possible instrument that could be useful in organising this transition. A number of measures have already been taken, including the development of guidelines for the environmentally sound management of ELVs and of standard AIS129, which is a voluntary auto industry standard for ELV management at authorised recyclers. The speaker also pointed to the key role that manufacturers can potentially play, due to the information that they have about the products, their ability to improve product design, as well as their financial capacity. The recently developed guidelines for environmentally sound management of ELVs identify the need to establish a shared responsibility scheme, including auto manufacturers, authorities and car owners.

Captain Mohan Ram, Society of Indian Automobile Manufacturers (SIAM), acknowledged that automobile manufacturers need to play an important role in confronting the challenge of ELV management and indicated that SIAM is committed to EPR as a possible approach. He emphasised that ELV management is a shared responsibility that needs strong involvement from government, in particular regarding the enforcement of environmental and social standards on recyclers and to support the transition from a mostly informal to a largely formal sector. He called for government action to help relocate current recyclers and establish certified recycling parks in all major conurbations.

In the stakeholder roundtable, the Mr Uwe Becker, GIZ, situated the issue of ELV recycling in the broader context of increasing demand for most resources and the opportunity that this represents for the sector. However, current recycling practices lead to the production of low quality secondary material. The formalisation of the sector could help to improve quality, reduce environmental impacts and strengthen social standards. In Brazil, there is some positive experience with organising informal operators into cooperatives that can be supported by producers.

Mr Praveen Kumar, National Automotive Testing and R&D Infrastructure Project, suggested that one of the key challenges was the development of a used parts market that could allow to achieve higher rates of reuse, where currently virtually the entire car is being shredded for material recovery.

Dr Suneel Pandey, TERI, pointed to the issue of plastics, a fast increasing material fraction in cars. While there are some efforts to develop pyrolysis as a material recovery technology, this has the disadvantage of destroying a large share of the material value. A better strategy would be to separate plastics by type so that they can be mechanically processed and reused.

In the ensuing discussion, several participants identified deregistration of cars at the end of life as an important issue that needs to be addressed in India, as there is currently no connection between the car registration system and end of life management. The development of capacity and skills in recycling facilities was seen as forming an important part of any efforts towards the formalisation and professionalisation of recyclers in the sector.

The workshop was concluded by Joint Secretary Mr B. Sinha, MoEFCC and Mr Shardul Agrawala, OECD who thanked all participants for their contributions and a rich and informative discussion over the two days and indicated that the meeting materials would be available at the OECD website: <http://www.oecd.org/environment/waste/events-on-extended-producer-responsibility.htm>.