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End of Life Vehicle Recycling in India

Production & Operations

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ABSTRACT

The number of vehicles plying the Indian roads has increased dramatically over the years. In the next ten years the annual production of cars is expected to reach 60 lakhs (Mohan Ram 2012). The increase in the number of cars has created the potential for environmental pollution problems, due to both cars in use and cars that have reached the end of their useful life. India is lagging behind many countries whose car populations are a lot smaller than India's, in handling problems due to cars that have reached the end of their life. This paper compares India's method of handling end of life vehicles (ELVs) with those of European Union, USA, Japan and China.

INTRODUCTION

India has achieved phenomenal economic growth in the past couple of decades after the liberalization measures undertaken by the Indian government. The salaries and disposable incomes have grown due to the economic growth. The liberalization measures have opened up the Indian borders to foreign competitors. The number of manufacturers and models of cars have multiplied. As a result of these, sales of cars have increased dramatically in the recent years. The Automotive Mission Plan 2006 – 2016 released by the Government of India proposes the following vision: "To emerge as the destination of choice in the world for design and manufacture of automobiles and auto components with output reaching a level of US$ 145 billion accounting for more than 10% of the GDP and providing additional employment to 25 million people by 2016" (Ministry of Heavy Industries & Public Enterprises 2006). Society of Indian Automobile Manufacturers (SIAM) (2014) provides the following passenger vehicle statistics:

	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13
Production	1,777,583	1,838,593	2,357,411	2,982,772	3,146,069	3,233,561
Domestic sales	1,549,882	1,552,703	1,951,333	2,501,542	2,618,072	2,686,429

These facts show us that the vehicle population in India is going to multiply rapidly, and that India will face ELV problem very soon. India has to adopt successful ELV strategies followed by other nations, or evolve one by itself. ELV recycling in EU, Japan, Korea, and China are controlled by legislation. In the US, ELV recycling does not have separate legislation, but is indirectly controlled by environmental protection laws. This paper compares the way in which end of life vehicles are processed in India, to the methods followed by countries such as US, EU, Japan and China.

ELV PROCESS WORLDWIDE

Sakai et al (2014) have studied and compared the ELV recycling processes of various nations. According to them ELV recycling is controlled by legislation in the European Union (EU) and the European Free Trade Association (EFTA), Japan, China, Korea and Taiwan. Also India, Russia, Mexico, Turkey, and Vietnam are in the process of introducing legislation to control ELV recycling. US, Canada and Australia have no direct legislation to control ELV recycling.

ELV PROCESS IN EU

ELV recycling process is controlled by legislation. EU-Directive 2000/53/EC was enacted in the year 2000 (Sakai et al. 2014; Simic 2013; Chaturvedi, Aurora & Sort 2012). Two principles, namely, the subsidiary principle and the extended producer responsibility (EPR) principle form the base for the directive. The subsidiary principle requires the members of the EU to establish legislations on ELV recycling. The extended producer responsibility principle makes the manufacturers and importers of the automobiles responsible for the ELV recycling cost. Targets were fixed for "reuse and recovery" and "reuse and recycling." The targets were 85 and 80% respectively in 2006 and 95 and 85% respectively in 2015. Eurostat – Data Explorer (2014) publishes the recovery and reuse percentages, and the recycling and reuse percentages of the countries of EU. For example: the recovery and reuse percentage was 79% in Estonia and 97.6% in Austria in 2011. The recycling and reuse percentage of the two countries was 76.1% and 82.8% respectively in 2011.

ELV PROCESS IN JAPAN

ELV recycling process is controlled by law. Law was enacted in 2005 (Sakai et al. 2014; Simic 2013; Chaturvedi, Aurora & Sort 2012). Instead of regulating whole vehicle recycling, separate targets are set for airbags, refrigerant gas and automobile shredder residue (ASR). The law lists components and materials that should be recycled, the party responsible for the recycling costs, and a system to manage the information. The target recycling rates for airbags and ASR are 80 and 85% in the year 2015. Buyers of vehicles pay the recycling fees at the time of purchase, and the manufacturers are responsible for the recycling of airbags and ASR.

ELV PROCESS IN CHINA

ELV recycling process is controlled by law. The law was enacted in 2001 (Sakai et al. 2014; Simic 2013; Zhou & Dai 2012). The purpose of the law is to prevent accidents due to old automobiles and use of refurbished parts. Reuse of engines, steering, transmissions, axles, and frames is prohibited. The Automotive Products Recycling Technology Policy was passed in 2006, which clarified the recycling responsibilities of automobile manufacturers. The recycling targets set by the policy are 85% for ELV and at least 80% material recycling by 2010, and 90% for ELV and at least 80% material recycling by 2012, and 95% for ELV and at least 85% material recycling by 2017.

ELV PROCESS IN US

No direct law addressing ELV recycling. ELV recycling is indirectly covered by other environmental protection laws such as the Resource Conservation and Recovery Act, the Clean Air Act, and the Clean Water Act (Sakai et al. 2014). For the most part, market mechanisms control ELV recycling. Automotive Recyclers Association (ARA) promotes ELV recycling. No compulsory ELV recycling targets are fixed, but 80% material recycling has been achieved. According to Automotive Recycler's Association (ARA), the US automotive recycling industry earns more than $32 billion in sales annually and employs over 140,000 people.

CURRENT ELV PROCESS IN INDIA

Chaturvedi, Aurora & Sort (2012) have researched the ELV in-

dustry in Northern India. According to them, the recycling of ELV in India is performed mostly by an informal unregulated sector. The number of ELV recycling units operating in Delhi is about 3200, and about 1000 in Kolkata. More that 100,000 families are expected to work in ELV recycling in India. The dismantling units are found both in the outskirts as well as in areas with a high concentration of population. The operations being informal don't follow environmental norms and result in heavy pollution. ELV recycling is done in Pudupet, Chennai in the middle of the city, similarly at Lohar Chawl and Chor Bazaar in Mumbai and at Ukkadam in Coimbatore.

Chaturvedi, Aurora & Sort (2012) make the following recommendations for the ELV industry in India:

(i) Transfer of vehicle ownership should be easy.
(ii) Adequate space should be allocated to ELV industry during town planning phase.
(iii) Companies that produce or sell vehicles should be made responsible for the disposal of the toxic components of the vehicles (Extended Producer Responsibility).
(iv) Training should be provided in dismantling of vehicles. Vehicle manufacturers should create and make available detailed dismantling information for their vehicles.

FUTURE ELV PROCESS IN INDIA

Malhotra (2011) provides the following updates about the draft proposal of Indian ELV and the SIAM recycling task force. The Society of Indian Automobile Manufacturers (SIAM) has formed a taskforce on "Recycling" with Capt. Mohan Ram of TVS as the Chairman. The taskforce approached the Ministry of Heavy Industries to set up a demo unit for vehicle recycling. Another task of the taskforce was to prepare a draft ELV regulation for India and propose it to the Indian government.

The Ministry of Heavy Industries and Public Enterprises has created an ELV recycling demonstration centre in Chennai under the auspices of the National Automotive and R&D Infrastructure Project (NATRIP) in cooperation with the Society of Indian Automobile Manufacturers (SIAM) (Chaturvedi, Aurora & Sort 2012). The centre is located at the Global Auto Research Centre (GARC), Oragadam, Chennai and its facilities have been designed based on globally efficient units (Mohan Ram 2012). The centre is not heavily automated like foreign recycling centres and will rely heavily on manual labour initially (Chandrasekaran & Padmanabhan 2011). The demo unit was setup at a cost of Rs. 1.5 crores (The Hindu Staff Reporter 2011). The Indian government is planning to set up 10 modern recycling centres by 2014 (Shukla 2011).

The Indian draft ELV proposal was designed using EU directives 2000/53/EC and 2005/64/EC as base (Malhotra 2011). According to CLEPA European Association of Automotive Suppliers (2011) the draft addressed the following four factors: collection, treatment, design for environment and implementation, and the expected target date for the Indian ELV regulation is 2015.

CONCLUSION

India can salvage over 1.5 million tons of steel scrap, 180,000 tons of aluminum scrap and 75,000 tons of plastic and 75,000 tons of rubber from scrapped automobiles using proper recycling methods (Carwale team 2011). Indian automobile manufacturers have made significant efforts through the Society of Indian Automobile Manufacturers (SIAM) to address the Indian end of life vehicle problem. But the manufacturers have not proactively addressed the issue of Indian ELV as individual companies. They seem to \be waiting for a regulation from the Indian government to comply with. This can be seen from the fact that International car companies while offering take back services in countries with ELV regulations (free of charge in some countries), do not offer any assistance for disposal of end of life vehicles in India. So the Indian government has to come up with strong regulations and implementation mechanisms to tackle the impending end of life vehicle problem in India. Popular recommendations from existing literature for the Indian ELV process are: manufacturers and sellers of automobiles should be made responsible for the recycling of ELV, or responsible for at least recycling the hazardous components, and tracking and transfer of vehicle ownership should be made easy to facilitate ELV recycling.

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