

APRIL 2021

# CIRCULARITY AND END OF LIFE VEHICLES

**INDIA INTERNATIONAL VEHICLE RECYCLING SUMMIT**

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# CERO (MAHINDRA MSTC RECYCLING PVT. LTD.)

## INDIA'S FIRST ORGANIZED VEHICLE RECYCLER GOING PAN INDIA

SUMIT ISSAAR  
MANAGING DIRECTOR  
MAHINDRA INTERTRADE LTD.





Environmental pollution has been an issue of great importance and great severity for the last several years. India ranks 168th out of 180 countries in the latest 'Environment Performance Index' conducted by EPI Envirocentre. With ever-rising pollution levels and newer vehicles entering the market, the situation is unsustainable. On average, 50,000 new vehicles are added on to Indian roads every day. Evidently, vehicles contributing to the rising levels of pollution are the old vehicles. An old car or an End-of-life vehicle (ELV), is responsible for polluting air 8 times more than a new one, and a 15-year-old truck is responsible for polluting the air 10 times more than a new one. In terms of a number of vehicles, as per the best estimates available, currently, there are close to 30 mn ELVs in India which have reached an age of 15 years. As per the latest data from the government, at least 10 mn of these vehicles do not have a valid fitness certificate. In the next 5 years, another 46 mn vehicles will cross the age of 15 years. Clearly, there is a need for a formal recycling sector and a water-tight scrappage policy implementation. Another relevant issue is scrap steel imports. India currently imports about 6 mn tonnes of scrap steel due to the gap of domestic scrap steel demand and supply, in turn spending precious forex reserves equivalent to ~\$ 2 billion. This gap can be bridged to an extent by generating scrap steel domestically through vehicle recycling. The situation demands a permanent solution.

Current setup for vehicle recycling in India is extremely unorganized and the majority of the vehicles are being routed through the informal sector which does not follow any Legal / Environmental / Ethical norms. The non-scientific manner in which processes are carried out in the informal sector leads to unusually low material recovery, causes environmental damage by way of water/air/soil pollution and provides unsafe working conditions for workers. Current unorganized system also lacks the visibility and transparency in the process for owners and the government. Vehicle owners might also get in trouble in case a vehicle sold to unorganized market is used in any illegal activity. Low overhead costs due to non-adherence of environmental/legal norms mean that the unorganized players can offer higher prices to customers compared to the organized sector resulting in more inflow of vehicles into the unorganized sector.

Mahindra group has always been committed to sustainable growth as the way forward. Sensing that there is a need for an organized player in ELV recycling space, Mahindra Accelo (a Mahindra group company) and MSTC (a Government of India enterprise under administrative control of Ministry of Steel) set up Mahindra MSTC Recycling Pvt. Ltd. (MMRPL) to scrap ELVs vehicles in environment friendly way.

#### Current setup of Informal recycling operations in India



The company has been set up with twin objectives of 'making the roads of India cleaner and safer' and 'Reducing India's reliance on scrap steel imports'. Under the brand name 'CERO' which means zero in Spanish, the company has set up state-of-the-art vehicle scrapping centres at Greater Noida, Chennai and Pune. The focus of the company is strictly zero tolerance towards 'pollution while recycling the vehicles, untreated discharge and unsafe and unethical practices' - hence the name Cero.

Cero is India's first government-authorized vehicle recycling facility. The automated plants are capable of recycling Trucks, Buses, Cars, Two / Three wheelers, Industrial scrap and Consumer durables and follow all the legal and environmental norms issued by CPCB and respective SPCBs for vehicle recycling. At these facilities, ELVs are depolluted, dismantled and scrapped using world-class machinery ensuring zero spillage of hazardous waste. Steel, which forms almost 70% of the car body goes back to melting furnaces where it is melted and converted into secondary steel, hence replacing the imported scrap steel.

The most important differentiator for Cero is that Cero provides its customers with a 'Certificate of Deposit' and 'Certificate of Destruction' which is proof that the vehicle has been dismantled as per government guidelines and has ensured that there is no environmental damage while recycling it. Along with the scrapping centres, the company also has a presence in major cities like Bangalore, Mumbai, Ahmedabad, Jaipur, Chandigarh and Hyderabad through its collection centres, taking the total presence to 9 cities. Cero has plans to expand its presence to 25 cities within the next 1 year and be able to cater to customers in Pan India. Very soon, Cero will be coming up with centres at Indore, Kolkata, Coimbatore, Nagpur, Bhopal, Udaipur, Rajkot, Madurai, Kochi, Bhuvaneshwar, Lucknow, Gwalior etc.

# Mahindra MSTC Recycling Private Limited

A joint venture between MSTC and Mahindra Accelo



## CERO

Moving towards a ZERO -  
pollution nation

With India's 1st Automotive & Steel  
recycling facility



Cero focuses on making the scrapping of old vehicles hassle-free for its customers. It handles the entire chain right from picking up the vehicle from Customers' home to towing it to the facility and recycling it. Customers only have call up Cero's toll free number 1800-267-6000 or log on to <http://www.cerorecycling.com/> and register an inquiry. After that, the entire process is handled by the CERO team. Customers get fairly compensated for the salvage value of the vehicle which is determined by a well-crafted evaluation model. To extend the customer convenience, Cero has also tied up with Mahindra & Mahindra Automotive as well as Renault India to provide scrapping services for their customers who wish to exchange a scrap vehicle at the time of new vehicle purchase. Similar such arrangements are under works with other OEMs as well. Customers can also donate their vehicle to Cero, which has tied-up with a Mahindra NGO dedicated to education of underprivileged girls.

The NGO will provide owners 80G certificate for tax exemption. Also, to address the issue of unorganized recycling and going by their motto of 'Sabka Saath Sabka Vikas', Cero is trying to integrate the informal dismantlers by including them in the business model at multiple steps in the value chain



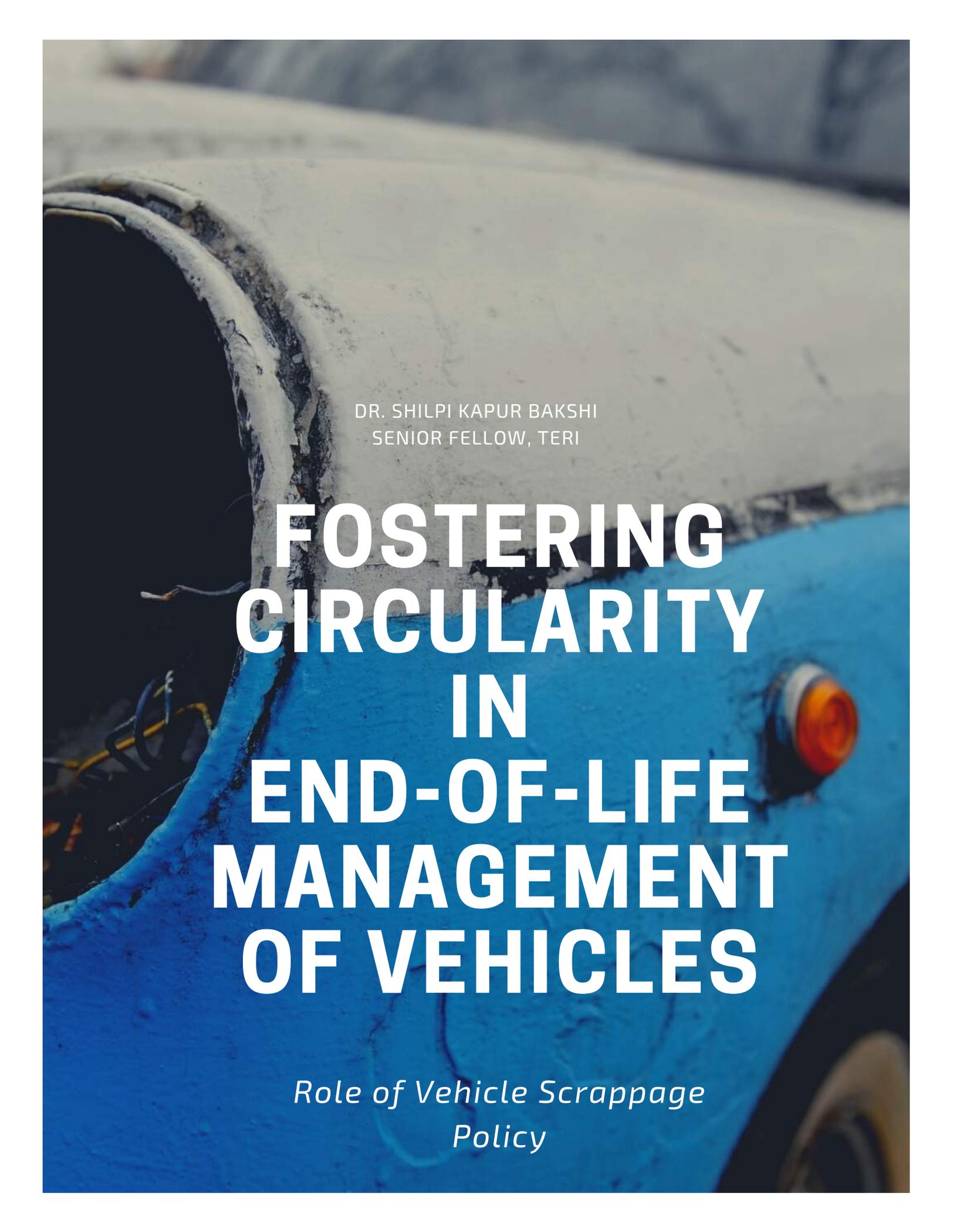
## Cero's current presence



There have been consistent efforts from the government to curb pollution (Commitment towards reducing pollution as per COP21 target) through policies, especially regarding taking old vehicles off the roads. The recent draft guidelines issued by Ministry of Road Transport and Highways (MoRTH) is a welcome step towards establishing recycling industry in India, guide customers to scrap their old vehicles and provide lucrative benefits for customers on new vehicles if they scrap their old vehicles. Proposed government guidelines on mandatory fitness testing, higher costs for re-registration and fitness testing etc. will prove to be good deterrents for people to keep running their old vehicles.

There have been consistent efforts from the government to curb pollution (Commitment towards reducing pollution as per COP21 target) through policies, especially regarding taking old vehicles off the roads. The recent draft guidelines issued by the Ministry of Road Transport and Highways (MoRTH) is a welcome step towards establishing a recycling industry in India, guide customers to scrap their old vehicles and provide lucrative benefits for customers on new vehicles if they scrap their old vehicles. Proposed government guidelines on mandatory fitness testing, higher costs for re-registration and fitness testing etc. will prove to be good deterrents for people to keep running their old vehicles. Also, the proposed incentives on the purchase of new vehicles post scrapping their old vehicles like Rebate on road tax, registration fee waiver, proposed discount from OEMs along with salvage value from ELVs will make it attractive for customers to scrap their vehicles.

If implemented in the right spirit, this can prove to be a good opportunity for growth. Critical success factors for policy success include Standardized adoption of the policy across states, Fast-tracking the changing of the nature of policy from voluntary to mandatory, Strict implementation of the fines & penalties for non-adherence to the new guidelines and Digital enablement of access to the Vaahan database and de-registration. With a clear and enforceable policy in place, CERO is looking to revolutionize the vehicle recycling industry and help India move towards a zero-pollution nation.



DR. SHILPI KAPUR BAKSHI  
SENIOR FELLOW, TERI

# FOSTERING CIRCULARITY IN END-OF-LIFE MANAGEMENT OF VEHICLES

*Role of Vehicle Scrappage  
Policy*



India, like many other countries across the world has witnessed increasing demand of various resources and the associated challenges in meeting this demand. The country also has high import dependency (nearly 100%) for the majority of the 'most critical' materials -cobalt, copper and lithium that find extensive application in high-end technology sectors. Secondary raw materials generated by recovering value out of end-of-life (ELV) products or waste can be again fed into the economy thereby helping to close the loop of sustainable resource circulation and reducing the demand for virgin raw materials.

With India having experienced one of the highest motorization growth rates in the world, and vehicles being one of the key aspects of consumer lifestyles, particularly

that of the middle-class segment of the population, the demand for vehicles and consequently the material demand in the auto sector has increased significantly. As per a 2016 study, under the business-as-usual scenario, the total material demand from 2015 to 2030 in the auto sector is expected to increase from 14.1 million tonnes to 102.1 million tonnes.

Resource efficiency and circular economy has a significant potential for reducing the material demand at different stages of the life cycle of an automobile. Auto manufacturers can make their production processes more resource-efficient, innovate to improve the design of motor vehicles to reduce the material demand, allow for their efficient repair and ease of disassembly improving recovery and recycling of materials.

Giving importance to the 'design for sustainability' concept can lead to vehicles being built to be as sustainable as possible over their entire lifecycle. Further, the auto sector through the use of end-of-life vehicles (ELVs) can also be an important source of secondary raw materials, such as metal, plastics and other materials and help foster a circular economy in the country. The Automotive Industrial Standard-129 (AIS 129) on reuse, recycling and material recovery from vehicles that were notified in 2015 requires 80-85 percent of the material used in vehicle manufacturing by mass to be recoverable/recyclable / reusable at the end of life.

Though efficient resource recovery and recycling from ELV may not guarantee that these resources are recycled back in the auto sector, but the recovered resources will find significant application in other sectors like infrastructure, which will help in reducing the pressure on virgin resources in the economy. For example, estimates suggest that steel scrap worth INR 115 billion can be generated in India from retired vehicles. Further, by remanufacturing components and a wide variety of parts, including engines and gear-boxes using those from ELVs, subject to it not being detrimental to their function, safety and reliability, promotes circular economy in the sector.

Further, there is a need for generating awareness and informing vehicle buyers about the benefits of the scrapping policy. Incentives like auto companies to offer 5% discount while selling a new vehicle against a scrapping certificate," or state government to give a road tax rebate of up to 25% for personal vehicles and up to 15% for commercial vehicles, have currently been suggested, though not mandated. It is important to make some of these incentives mandatory, though tradeoffs such as fall in state revenue collection proceeds due to the offer of road tax rebate need to be minimized.

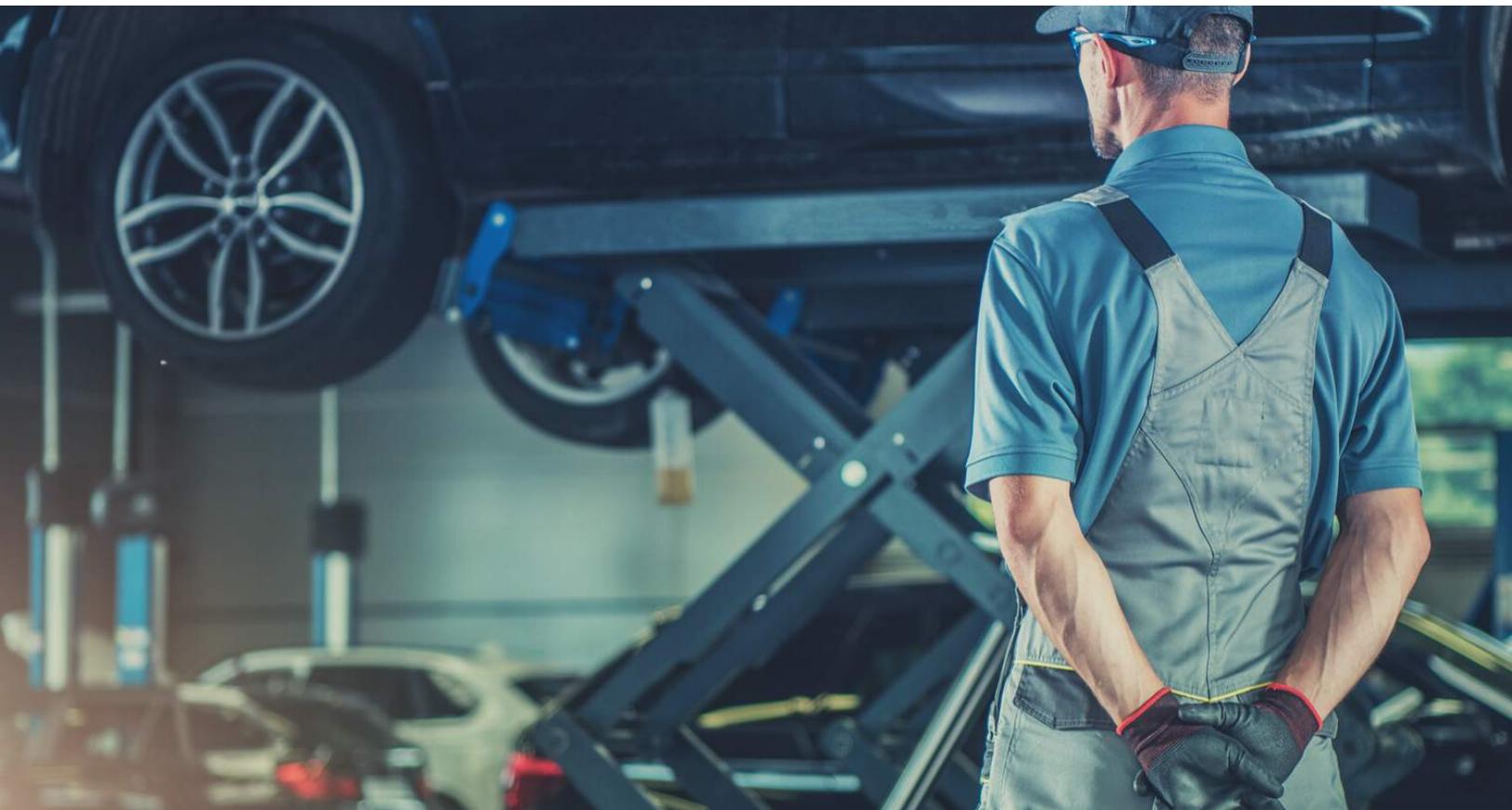
The recently announced vehicle scrapping policy through its emphasis on organized scrapping set ups and processes will foster improved advancements in ELV management and presents significant potential to push forward the transition to resource efficiency and circular economy in the auto sector. The policy is specifically also aimed at helping the government to move towards stringent emission norms and speed up the vehicle fleet modernization as a measure to curb pollution. The implementation of the policy will require investments and can boost economic growth, besides creating a large social impact, given the large informal sector already engaged in the ELV management activities. The modern production technologies will need to be complemented with new and improved recycling methodologies, where learning from other countries could be drawn on the latest techniques and processes. Public-private partnership models could be explored where the government could provide land, seed funding for these recycling parks to be set up. The informal sector could be integrated into these parks and their livelihoods improved both in terms of monetary compensation and better working conditions and environment. Setting up pilot initiatives including demonstration projects to impart knowledge and training to existing and potential entrepreneurs engaged in ELV management will be extremely helpful.

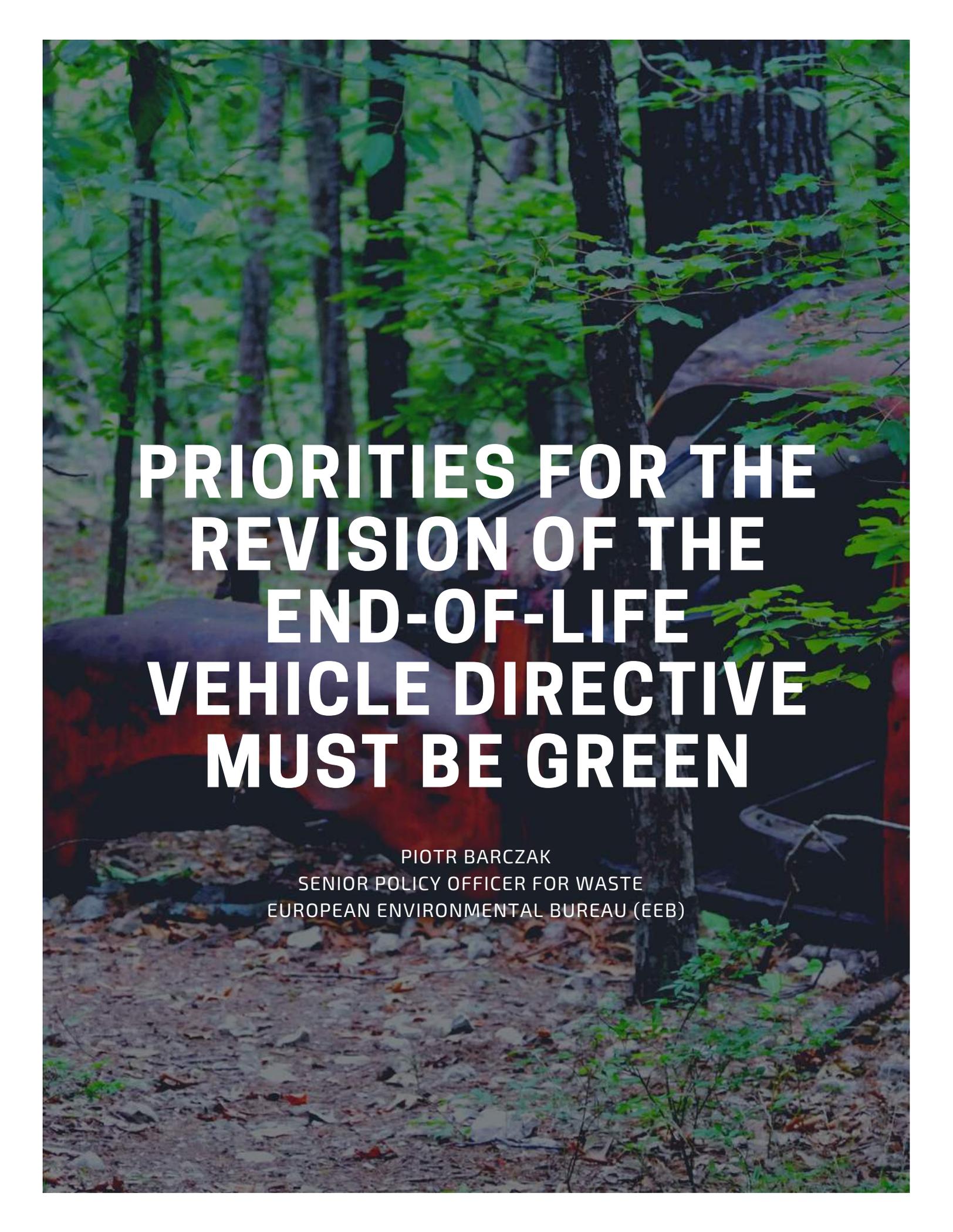
Investment in infrastructure such as the fitness testing centres, tie-ups between auto dealers and scrapping centres to facilitate the convenient transfer of old vehicle to organized scrapping set up, have to also be focussed on. Building in incentives to encourage move towards electric vehicles could also be integrated. The Delhi government, in its Electric Vehicle Policy, has already linked scrappage incentives with electric vehicles where the state government's incentive scheme has a cash subsidy based on battery capacity, and a scrappage-linked cash incentive as well. The policy should explore bringing in additional incentives if the new vehicle replacing the scrapped vehicle is electric. This will help the country to achieve its 2030 electric vehicle ambition and targets.

The scrappage policy certainly is a great policy initiative by the government. Further uptake of the same can be strengthened through designing state-level scrappage policies that are in line with the national policy objectives and foster state level milestones for setting up/scaling up scrappage infrastructure with adequate environmental safeguards for safe dismantling, disposal and material recovery. Developing innovative models to integrate the informal sector with the formal organized set ups should be a crucial focus that will also generate improved livelihoods for this sector and their upliftment.



DR. SHILPI KAPUR BAKSHI  
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TERI



A photograph of a rusted, abandoned car in a forest. The car is dark-colored and heavily corroded, with large areas of red rust. It is partially obscured by trees and foliage. The background is a dense forest with green leaves and dark tree trunks. The ground is covered in dry leaves and small plants.

# **PRIORITIES FOR THE REVISION OF THE END-OF-LIFE VEHICLE DIRECTIVE MUST BE GREEN**

**PIOTR BARCZAK**  
SENIOR POLICY OFFICER FOR WASTE  
EUROPEAN ENVIRONMENTAL BUREAU (EEB)



End-of-Life Vehicles (ELVs) amount to 8 million tonnes in the EU a year and raise several environmental challenges for EU governments. Large amounts of waste could be cut down if national authorities put in place the right policies and followed the Waste Management Hierarchy outlined in the EU's Circular Economy strategy. According to this strategy, waste streams should be tackled at the source by improving the design of vehicles at the production stage, which would help reduce most of the environmental impact of ELVs, notably by incentivising durability and repairability, facilitating recycling and avoiding the circulation of toxic substances.

The European Environmental Bureau with its members outlines several recommendations that can help the automotive sector move towards more responsible and circular business models and bring it in line with the EU's overarching European Green Deal.

Starting from the designer's table, greater attention will need to be given to how the design of vehicles can influence their full life-cycle impacts. Eco-design style measures already applied in other product groups, e.g. the Essential Requirements for the PPWD in the case of packaging, and the Eco-design Directive for energy-using products, demonstrate that minimum requirements can support broader material and energy efficiency objectives. It might be particularly important in the time of the transition towards zero-emission vehicles, where design for reuse, remanufacturing, refurbishment, repair and recycling will become more important than ever.

Eco-design measures for EV's batteries are expected to be developed during the revision of the Batteries Directive.

However, these measures will not address other parts of the vehicle, such as chassis, vehicle management system, etc. where extending mileage before the end of life of vehicles may present the most desirable option from a climate and environmental perspective.

Regarding material loops, it is already at the design stage one has to think about a harmonised product passport to facilitate the information flow from producer to recycler; a product information system shall be established in the form of an inventory of substances of concern, building on the existing sector database of the sector and supported by the new ECHA database. Such a product passport should contain the full bill of materials, key performances of the vehicle, durability, repairability, life-cycle

environmental footprint and chemical content, to improve dismantling of the problematic substances (ie PVC, PU, Batteries etc). A similar inventory requirement exists in the EU Ship Recycling Regulation. Additionally, the Directive's provisions regarding safe pretreatment of components containing hazardous substances should be made stricter.

The ELV Directive should better reflect the Waste Management Hierarchy, where prevention is the top priority, followed by reuse. The current target does not give enough attention to such activities as reuse or preparation for reuse. Not only should this difference from recycling be visible in reporting the rates, but also a separate mandatory target for reuse should be considered to incentivize this activity. The rules to incentivize reuse should also be harmonized across the EU to avoid market distortions.

We recommend binding requirements to ensure non-destructive disassembly and removal of all reusable modules from the vehicle before shredding, and to store them safely for reuse. The easiness and economic feasibility of dismantling before shredding depend on design for dismantling, therefore that should also be one of the minimum requirements for the design stage. Appropriate dismantling of layers and modules will also facilitate quality recycling. It also depends on a functioning IDIS (International Dismantling Information System).

After reuse comes recycling. The calculation methodology for the targets should be clear and the same across all Member States to better reflect the progress of the sector in terms of reuse and recycling and to make data more reliable and comparative. Any double calculation in two different registries should be avoided. Any residues coming from recycling operations should be deducted in order to avoid inaccurate inflating of reported rates.

Additionally, a target for recovery should be taken out of the Directive. Reuse and recycling provisions should be better enforced, while recovery term is redundant and only drives incineration of materials, which does not improve the circularity of the sector.

The recycling target today is high but does not incentivise the recycling of specific materials. It can be easily achieved by recycling the easiest to recycle materials (i.e. steel). To ensure recycling of other materials,

especially light-weight critical raw materials it should be considered to set material-specific recycling targets rather than overall weight-based targets. Lastly, the vague definition and calculation of recycling and recovery opens door to much incineration and backfilling of ELV materials that should instead be dismantled and recycled. This loophole is crucial to amend to bring the automotive sector closer to the circular economy.

Hand in hand with recycling requirements goes recycled content. The revision of the Directive could set a mandatory recycled content rate. Such a target could be differentiated per material and staged over 2025 and then 2030 years. The uptake of recycled contents should ensure the same standards apply for recycled materials as for virgin materials with regards to performance and chemical contents, and the potential incentives and obligations should clearly refer to this.

Lastly, the revision of the ELV Directive should align closely with the upcoming revision of the Batteries Directive, as the market continues to experience rapid growth in electric vehicles use and related use of batteries. The revision of the ELV Directive should set appropriate rules on dismantling and repair information (IDIS) provided to end-of-life users by the producers and enable second life for batteries from ELVs.

The revision of ELVs should remediate to some identified implementation gaps and remaining legal uncertainties. Without entering the detailed description of those issues largely covered by existing studies, the main implementation difficulties should, however, be reminded and built upon to ensure the improvements suggested along the above directions would be properly formulated and associated with the relevant conditions to enhance their implementation and enforcement.



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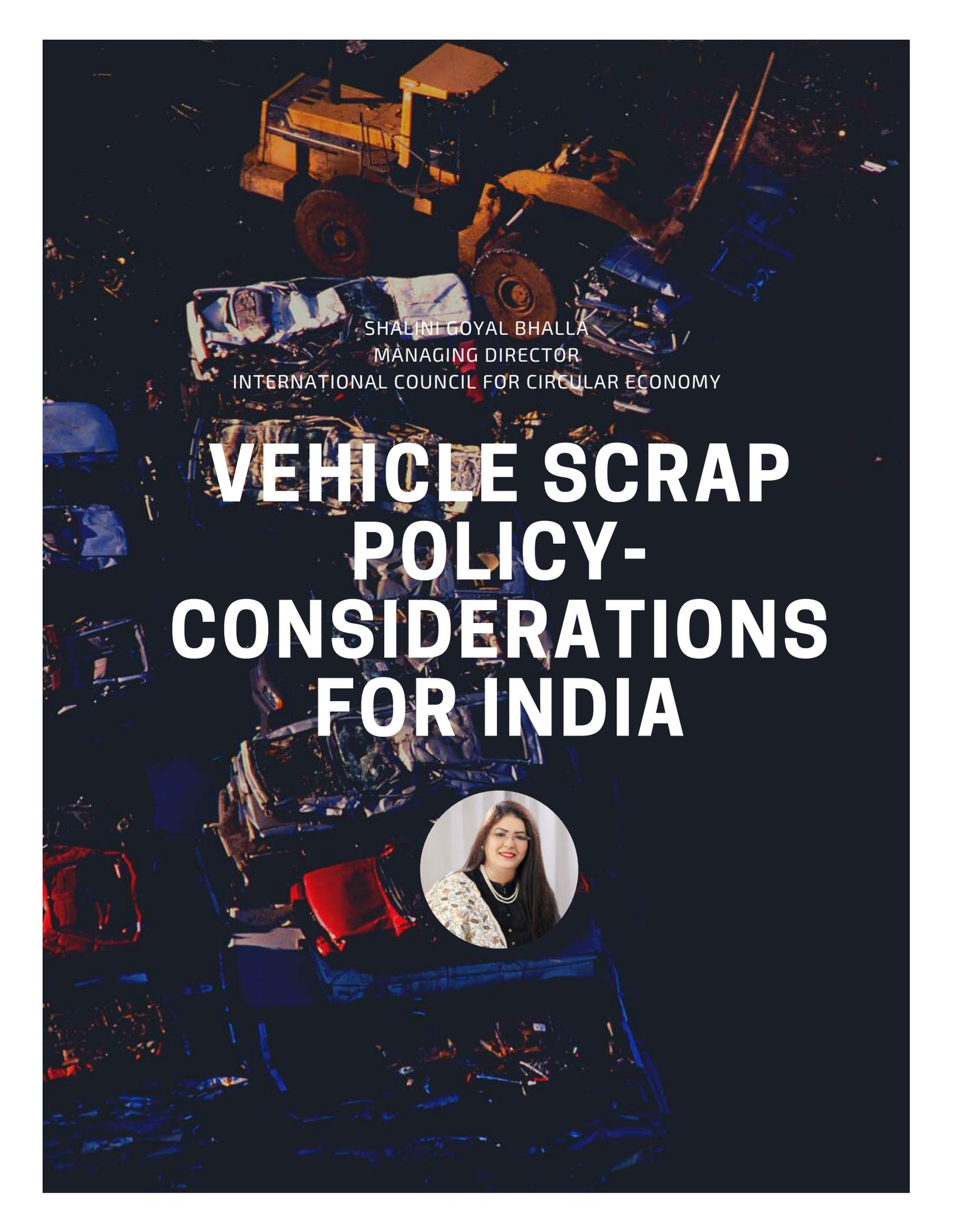
If you would like to find out more, please contact [piotr.barczak@eeb.org](mailto:piotr.barczak@eeb.org) or visit The European Environmental Bureau.

Alternatively, Piotr will be speaking at BCF's, 3rd Annual Vehicle Recycling Conference that will take place online from the 15th – 16th October 2020.



International Council For Circular Economy





SHALINI GOYAL BHALLA  
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INTERNATIONAL COUNCIL FOR CIRCULAR ECONOMY

# VEHICLE SCRAP POLICY- CONSIDERATIONS FOR INDIA



The transport ministry in India is charting out the details of the vehicle scrapping policy after it was announced in Union Budget for FY 2022. Giridhar Aramane, Secretary, Ministry of road transport and highways, told that the policy would consider incentive and disincentive schemes.

Shekar Viswanathan, Vice Chairman of Toyota Kirloskar Motor (TKM) had also urged the Centre to come up with a vehicle scrapping policy without which pollution control goals in India would only remain on paper. India has significantly improved the quality of fuel through Central government initiatives of rolling out Bharat Stage emission standards. Two major oil companies, Indian Oil Corporation (IOL) and Bharat Petroleum (BP) rolled out BS-VI fuel at their fuel stations in March 2020.

BS norms have helped India reduce pollution but the efforts would go futile if the old vehicles are still allowed to run on the roads. The vehicle scrap policy is a welcome move to tame the increasing vehicular pollution.

However, India must consider some critical measures while designing the scrap policy. The policy should consider the circular approach rather than limiting its purview on emissions. While the government works on scrap policy, they should also consider bringing a remanufacturing council to life. If India wants to make its economy circular then it must consider bringing in clarity for the businesses and the regulators on remanufacturing, and dismantling standards. The standards should ensure that while the end of life vehicles are dismantled, it is done so in the safest and environmentally friendly manner.

India has Extended Producer Responsibility (EPR) law for plastic manufacturers. EPR puts the financial and/or physical onus on manufacturers for the treatment, recycling, reuse or disposal of products after a consumer has used and disposed of them. Extending this policy to automobile manufacturers would be helpful to lay down the responsibilities. Since the life of tyres is lesser than the vehicle itself, considering EPR for tyre manufacturers would be beneficial at this stage.

It must become mandatory by law that all the end of life vehicles be sent to a registered end of the life vehicle recycling facility. This will ensure that vehicles are recycled in an environmentally safe manner. With 24 million end of life vehicles India has a lot of potential to manage multiple vehicle recycling facilities in the country. This would not only boost the economy but will also create a lot of jobs.

Technological interventions that would ensure a strict adherence to all the necessary legal and environmental guidelines should be introduced. Latest technologies like blockchain could help maintain transparency throughout the selling and scrap procedure. The recycling facility should have a robust tracking system to ensure proper disposal of the vehicle.

With the massively unorganized, informal and fragmented recycling market India needs stringent policy and its implementation to be sure of meeting their objectives.

A photograph of several rusted vintage cars parked in front of a wooden building in a rural, hilly landscape. The cars are heavily weathered and show significant rust. The building has horizontal wooden siding. The background shows a grassy field and a hillside under a clear sky.

SANJAY MEHTA  
MRAI

# EPR COULD BE A KEY ENABLER IN ELV RECYCLING REGIME

Can incorporating Extended Producer Responsibility (EPR) norms into the end-of-life vehicle (ELV) Recycling policy framework help the industries and the economy? It is a pertinent and important question when India is getting ready to kick start the National Automobile Recycling Programme.

Before we look at EPR and its components that have started helping Indian plastics and e-waste industries address their waste management-related issues and how it could compliment automobile recycling, let us understand the salient features of the recently announced ELV policy.

The policy makes it mandatory for personal vehicles to undergo fitness and pollution tests in automated facilities after completion of 20 years, while commercial vehicles are subjected to the same after 15 years. There are provisions to make the vehicles that fail in the tests penalised or impounded or both.

It proposes to set up fitness test facilities under public-private partnership (PPP) mode, with the government assisting private partners and state governments in the establishment of scrapping centres.

According to the policy, automobile makers will provide a 5% rebate to customers on their new purchases in lieu of scrapping their old ones. Besides, there are provisions for green taxes and other levies on old polluting vehicles.

Among the various objectives of the policy, it aims to reduce the presence of old and polluting vehicles on the roads, to achieve 25-30% reduction in air pollutants. ELV recycling can reduce GHG emissions by 1,600 Kgs for cars, 200 Kgs for 2 wheelers, 500 Kgs for three-wheelers, 3000 kgs for light commercial vehicles and 8000 Kgs for larger commercial vehicles. Some of the other benefits would include 50% reduction in water consumption.

If carried out systematically using appropriate technologies, ELV recycling can confer great benefits to society such as

1. Energy saving – Annually 4.5 MW/Hrs due to recycling of Aluminium and 2.95 MW/Hrs due to Steel Recycling, increasing at a compounded rate of 10% annually.
2. GHG reduction – 3.1 million tonnes by 2015, increasing at a compounded rate of 10% annually.
3. Material recovery – 2.1million tonnes of Steel scrap and 0.225 million tonnes of Aluminium, increasing at a compounded rate of 10% annually.
4. Forex Savings due to reduction of imports – \$0.8 billion, increasing at a compounded rate of 10% annually.

Besides improving road and vehicular safety and fulfilling India's climatic commitments, it will also help to achieve better fuel efficiency, formalise vehicle scrapping activities and boost availability of low-cost raw materials for the automotive and electronics industries.

For example, nearly 50-60% of the spares are recovered from passenger vehicles and over 75% from two-wheelers, while commercial vehicles yield spares in the range of 50-60%. In short, it is an opportunity of a market worth Rs 49,60,000 crore. The policy will help India to seize the mega opportunity. India is the world's largest manufacturer of 2 wheelers, 3 wheelers and tractors and is the 5th largest automobile manufacturer in the world with approximately 66 automobile manufacturing companies, employing 32 million people. The automobile sector contributes ~ 7% to GDP of the country's annual production. Over the years, India has seen the humongous growth of used vehicles in the country and experiencing the burden of its ever-growing pile of ELVs. As per a SIAM report, the ~ 8.7 million end-of-life vehicles in 2015 is projected to reach 22 million by 2025. As automobiles are amongst the richest source of quality scrap, for resource-starved India it is a veritable mine and its recycling is an absolute necessity.

If the policy is put into operations today, official statistics seem to suggest, India could be dismantling a large stockpile of over 1 crore of old and dilapidated vehicles. The country has over 51 lakh light motor vehicles that are older than 20 years, about 34 lakh light motor vehicles that are 15 years old or more. There are also around 17 lakh medium and heavy commercial vehicles older than 15 years and without valid fitness certificates. Older vehicles pollute the environment 10 to 12 times more than new models and pose a great risk to road safety. It is to be remembered that India houses 22 of the world's 30 most polluted cities.

Material Recycling Association of India (MRAI) has been urging the Government for the National Material Recycling Policy, which is under its consideration for long. If the ELV Policy and National Material Recycling Policy are implemented, it will lead to a huge increase in availability of domestic scrap, besides creating jobs opportunities of more than 3 million direct and 10-15 million indirect new jobs by 2025. It is also estimated to see substantial increase in the gross value addition to the economy of about 10 lakh crore, with enormous saving in GHG Emission and energy consumption and reduced landfills by unlocking the huge land bank for commercial purpose.

The Policy which could prove to be a game changer for Indian Steel Industry, besides boosting the fortunes of recycling industry manifold. The salient advantages to the economy could get amplified with the help of EPR.

EPR as a practice and policy approach makes producers take responsibility for managing products they produce at the end of their useful lives. Responsibility may be fiscal, physical or a combination of the two. In doing so, EPR shifts the financial burden of recycling from the ratepayer or government to the producer and consumer of the products and packaging is being recycled.

EPR would, therefore, ensure that the responsibility lies with the automobile industry to tie up with recyclers so that at least the mandatory 35% of their products gets recycled. This EPR program will attract many new recyclers to come forward and join the ELV recycling trade. This will also create huge employment.

ELVs are already one of the most recycled products in the world, and over 80% of an average vehicle is recyclable. But in India most ELVs are not going for disposal.

Here the majority of ELVs are not being dismantled in an environmentally responsible manner. In such a sorry state of affairs, setting up a common environmental standard for dismantling of ELVs should be the automotive recycling industry's focus and EPR could help them greatly in this regard.

With India targeting to achieve the \$5 trillion economy by 2024, the resource requirements of our industries would increase manifold with estimates suggesting tripling of annual material consumption by 2030, compared to 4.83 billion MT in 2009.

The Draft National Resource Strategy of the Government reveals that if the current production trend continues over the next 15 years with no substantial resource use reduction and/or substitution, the total demand for six major raw materials, i.e. iron and steel, aluminium, copper, plastics/composites, zinc and nickel would increase from almost 14 million tonnes in 2015 to more than 102 million tonnes by 2030. Accordingly, the material deficits would rise to 70MMT for ferrous scrap, 9 MMT for aluminium scrap and about 1.5MMT for copper scrap. Estimates for cobalt, lead, zinc, lithium and rare earths vary which, except for lead and to an extent zinc, all of them imported.

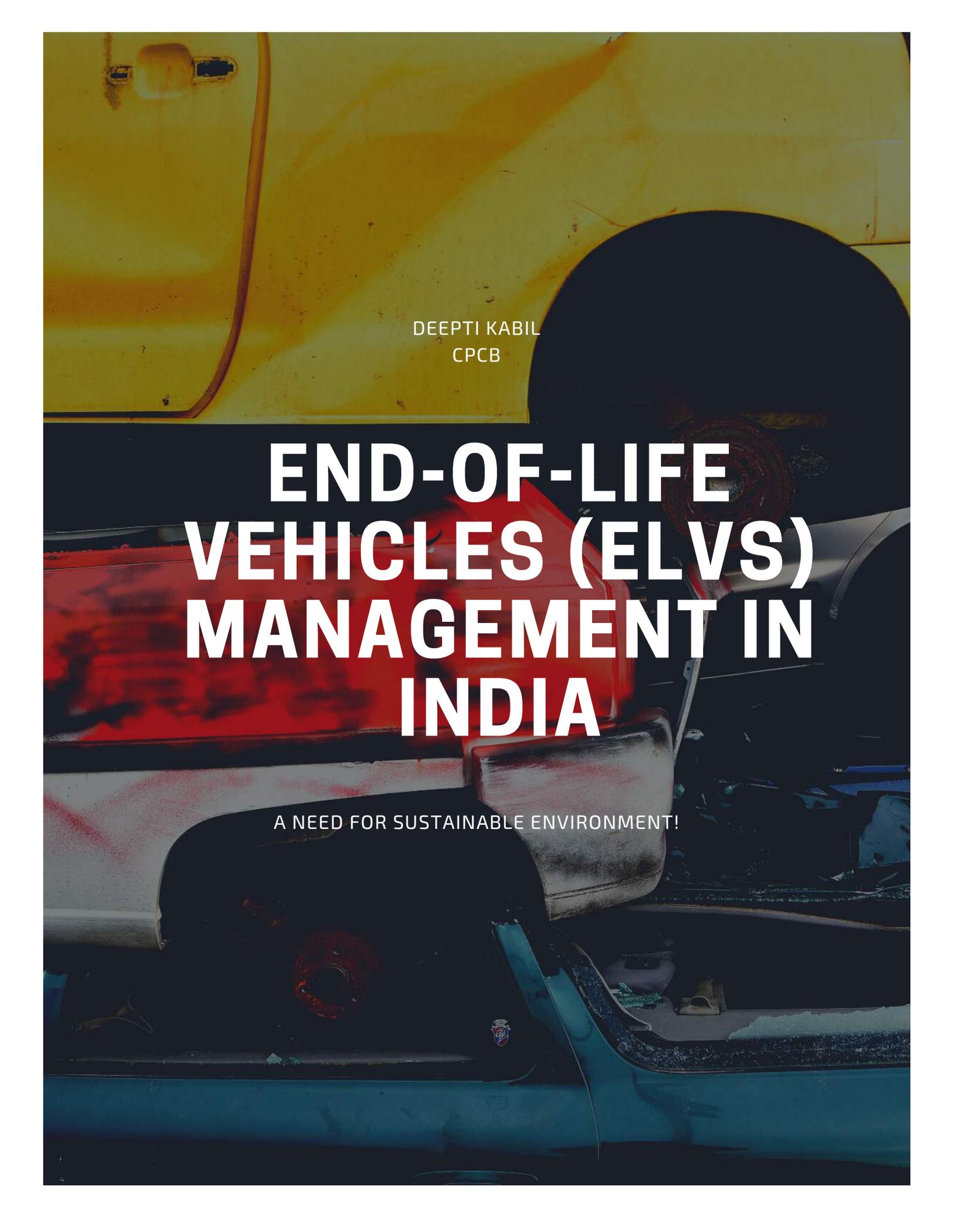
The National Steel Policy aims to develop a globally competitive steel industry by creating 300 MM TPA with a contribution of 35-40% through the Electric Arc Furnace/Induction Furnace Route both of which depend more on scarp than ore.

Hence the availability of scrap becomes critical to its success and the minimum requirement of steel scrap alone would rise from 28 MMT to 65 MMT by 2030. The ELV policy, ably assisted by EPR norms could adequately give fillip to the growth in demand for scrap.

The year 2021 will go down in the history of India as it has all the markings of a watershed in the country's economic progress. Amidst the increasing challenges following the outbreak of covid-19 and the resultant supply side disruptions, loss in production, rise in input costs, trade disruptions, etc. the Government has ushered in the Automobile Recycling Policy or end-of-life vehicle (ELV) recycling regime. Even though it has been in making for some time, the Policy could be seen as happening at the right time and its inherent quality as a Game Changer helping leverage maximum advantage to the economy which is on an all-out war to become atmanirbhar. EPR could only compliment the ELV policy, making it more comprehensive and self-sustainable, while facilitating India to meet circular economy and sustainable development goals.



SANJAY MEHTA  
MATERIAL RECYCLING ASSOCIATION OF INDIA  
MRAI



DEEPTI KABIL  
CPCB

# END-OF-LIFE VEHICLES (ELVS) MANAGEMENT IN INDIA

A NEED FOR SUSTAINABLE ENVIRONMENT!

In the coming decade, India is expected have a load of over 02 crore old vehicles nearing end of their lives. These, along with other unfit vehicles, will cause huge pollution and environmental damage as per an assessment reported in CPCB report. There are some 28 million vehicles in India that are at least a decade old. End of Life Vehicles (ELVs) refer to those vehicles that have come to the end-of-life due to wear and tear or due to unnatural reasons such as an accident, fire, flood or vandalism damage, etc. ELVs can be an important source of secondary raw materials, such as iron scrap, non-ferrous and other materials, which if salvaged and/or reused/recycled, can be again fed into the economy thereby helping to close the loop of sustainable resource circulation and reducing the demand for virgin raw materials. There are several standards, policies and guidelines laid down for management of such ELVs in India, in order to increase the reuse/recycling of ELV scraps in an environmentally sound manner.



In present scenario, dismantling (scrapping) and recycling of ELVs is carried out mostly by informal and unorganized sector thereby causing environmental and health risks. Realizing the potential growth in ELV recycling activity in coming years and the need for environmentally safe recycling/recovery of materials from ELVs and, efforts have been made by various Ministers to promote recovery and recycling of secondary material considering the environmental, safety and health aspects and also by transformation of the unorganized sector into the mainstream to practice the same.

The Transport Department of NCT of Delhi has prepared "Guidelines for scrapping Motor Vehicles in Delhi, 2018" focusing on the proper channelization for scrapping of ELVs. Further, the Ministry of Steel has notified the Steel Scrap Recycling Policy on 07th November, 2019, the policy aims to promote a formal and scientific collection,

dismantling and processing activities for end of life products (including End of life of Vehicles) that are sources of recyclable (ferrous, non-ferrous and other non-metallic) scraps which will lead to resource conservation and energy savings and setting up of an environmentally sound management system for handling ferrous scrap.

Currently, Section 59 of the amended Central Motor Vehicle Act of 2019 provides for fixing of age and restrictions on the plying of unfit vehicles. The environmental compliances for scrapping and recycling activities of ELV shall be in accordance with the prevailing laws such as The Water (Prevention & Control of Pollution) Act, 1974; The Air (Prevention and Control of Pollution) Act, 1981 and the Environment (Protection) Act, 1986 and the rules made there-under. Scrapping and recycling facility of End-of-Life Vehicles (ELVs) has been categorized under "Orange" based on pollution potential in terms of emission and disposal method.

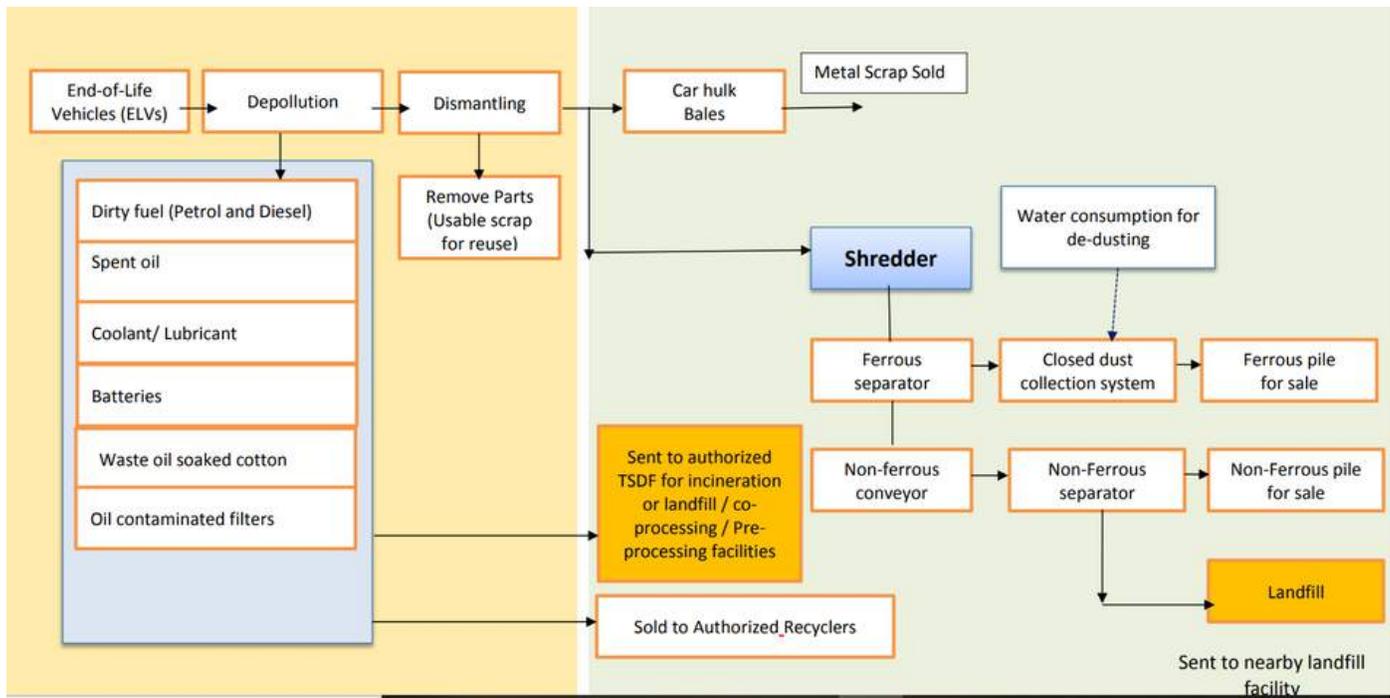
On the other hand, the CPCB has taken the step to formulating “Guidelines for Environmentally Sound Facilities for Handling, Processing and Recycling of End-of-Life Vehicles (ELV), 2019” to minimize environmental hazards from scrapping/recycling of vehicles. ELVs are known to contain hazardous substances in the form of waste oil, used lubricants, used lead-acid batteries, lamps, electrical and electronic components, airbags, spent catalysts, etc. The environmentally sound recycling process of ELVs management comprises four major stages i.e. De-pollution, Dismantling, Shredding and treatment of Automotive Shredder Residue (ASR) by recovery/recycling or by ultimate disposal through incineration or landfilling. The said guidelines outline the requirements and procedure for setting up and operating of ELV management facility unit Presently, the scrapping of ELVs takes place via collection, de-pollution, dismantling and bailing process as there is no shredding facility available in the country. The process flow for scrapping with and without shredding facility is explained in the diagram below.

In order to promote voluntary vehicle scrapping, the Government of India (by Ministry of Road, Transport and Highway, MORTH) has announced the Vehicle Scrapping Policy in the Union Budget for 2021-22. The key features of the policy are as below:

- Commercial vehicles to get fitness certificate for the vehicles after 15 years and must be de-registered if found unfit, whereas, private vehicles must de-register after 20 years. Such de-registered vehicles to be handed over to scrapping facilities along with vehicle registration and other related documents.
- Scrap Value for the old vehicle (approx. 4-6% of the ex-showroom price of a new vehicle) be given by the scrapping center.
- State governments are advised to rebate road tax @ 25% and 15 % on personal and commercial vehicles, respectively.
- Registration fee may also be waived for the purchase of new vehicles against scrapping certificate.
- The vehicle manufacturers are also advised for providing a discount of 5% on the purchase of a new vehicle against the scrapping certificate.



In this regard, mandatory testing of personal vehicles will start from June 2024 in all probability, albeit in a phased manner. Whereas testing for commercial vehicles is expected to begin from April 2023. The successful implementation of the above policies depends on information flows with regard to current generation and management of ELV that needs to be updated periodically besides capacity building to enhance the understanding of the involved stakeholders. This necessitates the need of conducting study/survey by the State/UT government through agency that may help in streamlining the informal sector (Local scrap sellers/buyers) into formal chain of ecosystem.

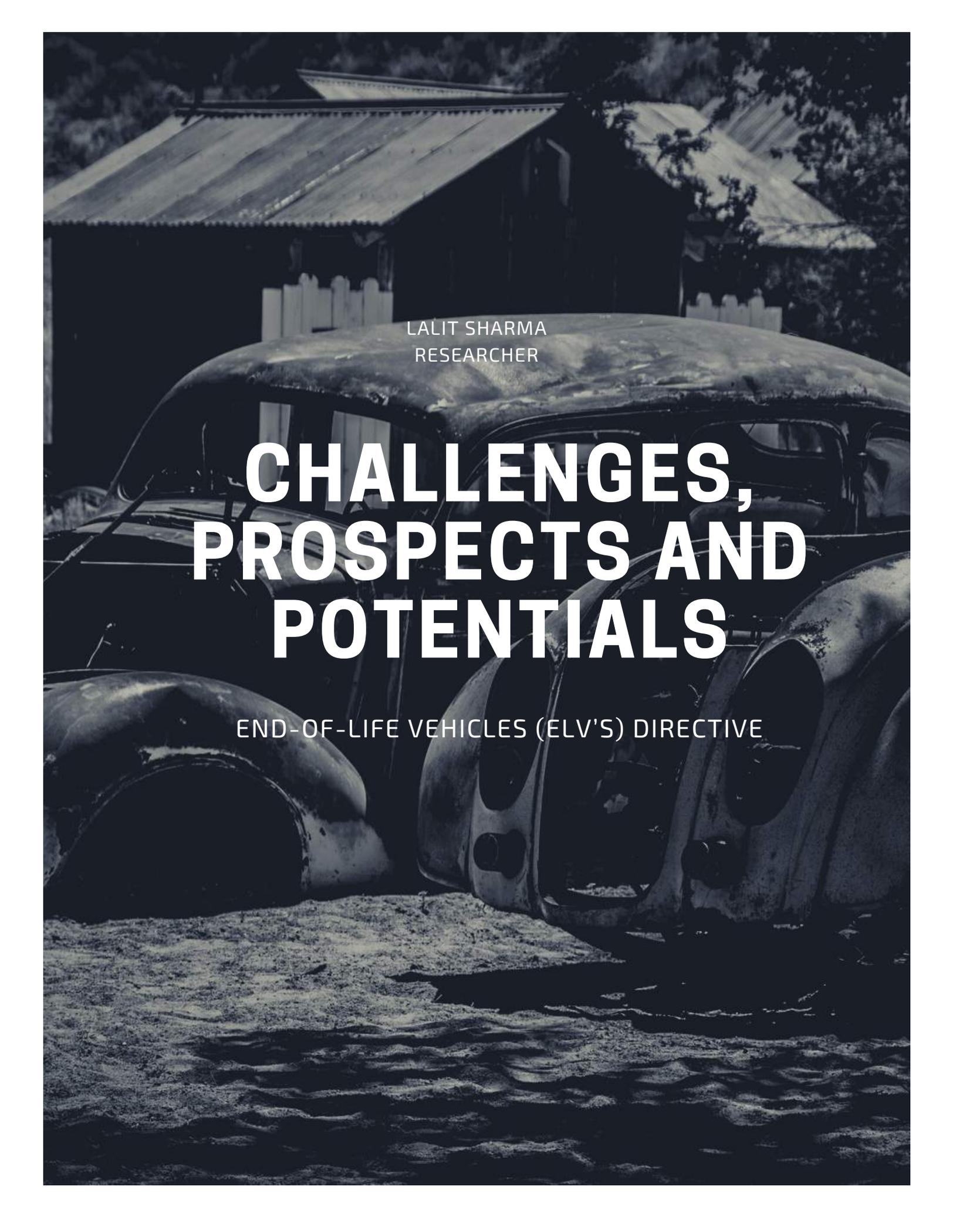


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# CHALLENGES, PROSPECTS AND POTENTIALS

END-OF-LIFE VEHICLES (ELV'S) DIRECTIVE

Resource use has been one of the predominant concerns of the 21st century since they are finite and are continually extracted at a significant rate, but in the last couple of decades, the world has been witnessing a tremendous increase in the housing, transportation and energy demands which has exponentially increased the pressure on the existing resources making the world grapple with challenges associated in meeting the resource demands. Developing countries' being at the cusp of urbanization, industrial development and socio-economic growth is expected to experience additional pressure on the existing resources due to escalating demands especially in Resource Intensive Sectors.



Automotive industry is amongst one of the most resource consuming sectors (owing to the lifecycle of a vehicle) which requires large quantities of raw materials and fossil fuels during its production stage and also produce immense environmental impacts in the form of air emissions in the production, consumption as well as post consumption stage (Jody and Daniels, 2006). Furthermore, since automobile ownership has been increasing at a higher rate than the global population and reached more than 1 billion units in 2010 (Sakai et al., 2014) with notable increase the Asian, Central America and South America regions. With number of owned automobiles, the generation of end-of-life vehicles (ELV) has also increased posing numerous environmental challenges like air pollution, water pollution and human health implications especially in the developing nations which lack an efficient

and regulated ELV management system, mainly due to lack of regulatory framework. Even the countries with framework are struggling with the issue of Auto Shredder Residue (ASR) due to recovery targets and as it often also contains hazardous substances such as lead, cadmium, and Poly Chlorinated Biphenyl (PCB) and so many countries have classified ASR as hazardous waste and have established legislative controls (Vermeulen et al., 2011). The ever increasing privatization levels across the world and especially in India indicates that ELVs is an emergent waste stream which needs due and timely consideration and management to curb and reduce the environmental impacts (Sharma and Pandey, 2020) and so establishing regulatory framework becomes absolutely essential

Since the Directives/Regulations are mainly motivated around the hazardousness of ASR's, there is another way to look at this, that countries with a legislative ELV system commonly set a target for recovery rates, with many aiming for more than 95% recovery and so in order to reach this target, higher efficiency in ASR recovery is needed in addition to material recycling of collectable components and metals. Since recycling of ASR is important for overall ELV regulation though it's considered very difficult (since ASR has a high calorific value, ash content, heavy metals and fine particles that are hard to separate) most of EU countries has taken directions of opting for post-shredder treatments (PSTs) involving the collection of materials from ASR after the shredding stage, which yet contains up to 8% of metals and 40% of polymers that could be recovered (Santini et al., 2011)

However, many studies have already suggested that, intensive dismantling would reduce the generation of ASR as well as its hazardousness, yet, intensive dismantling would be effective in protecting the environment (Kohlmeyer et al., 2014). However, its economic efficiency is unreliable due to the rise in labor cost and the drop in the price of collectable materials, hence the application of PSTs has been taken as necessary option, to meet the EU regulation, but that shall not be necessarily the case with developing countries as the situation here is absolutely contrast (Sakai et al., 2014). India can customize the overall ELV management by bringing appropriate directives as per country specific situations indeed with ambitious goals in terms of recovery, reuse and recycling of ELVs (following some initiative from developed world) but not by detaching the dismantlers of the informal segment, who perform manual separation, as they have huge potential to favourably contribute in bringing better efficiency and circularity in overall ELV management (Kuşakcı et al., 2019). Few more studies advocate this statement that manual dismantling brings additional benefit in recovering resources from ELV for example (i) Car seats play an important role in the generation of ASR because they are the main source of Polyurethane Resins (PUR) and textiles, accounting for more than 20% in weight of the total ASR, hence can be saved, (ii) by removing bumpers, tires, fuel tank and glass total ASR weight in a case study decrease about 30% hence increased recycling rate upto 7% (Santini et al., 2010). Therefore, it can be concluded that directives shall not be avoided but there shall be judicious consideration of country specific situations and they shall not be simply adopted from developed world. Carving sustainable future demands many initiatives and one way to tackle these adverse impacts of resource crunch on environment and economy is that every country needs to use resources efficiently. Growing country as India, definitely needs market transformation towards more resource efficient practices and technologies coupled with behavioural change from consumers for dealing with ELV stream. Present study as a research, represents that what can be the appropriate rationale behind directive (here in context to India) and also shows that if SRM from ELV can be utilised well by bringing them in material cycle again, it creates ideal example of establishing circular economy.

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