Making of an effective scrappage policy for emissions gains and material recovery

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Online Roundtable:
What to do with old vehicles?
Towards effective scrappage policy and infrastructure

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Blue sky and preparing for the new normal
Fleet renewal: Opportunity for green recovery?

- BS VI emissions standards in place
- Phase in of real world emissions regulations has started
- Electric vehicle programme takes root

How can these be leveraged for emission gains and material recovery?
Why spotlight on old vehicles?

**Clean air:**
- Hot spot action in cities -- Supreme Court, High Court, and NGT capping age of vehicles in polluted cities (Delhi, Kolkata, Lucknow, Kanpur etc)
- Clean air plans under National Clean Air Programme (NCAP) include old vehicle phase out
- Green tax burden on older vehicles (Maharashtra and Karnataka etc)
- Fleet renewal can maximise emissions gains

**Climate impacts:**
- Old, ill-maintained and malfunctioning vehicles guzzle more fuel
- Black carbon from old diesel vehicles trap more heat than CO2

**Environmental impacts of clunkers:**
- Toxic and hazardous waste, heavy metals - pollute air, water and soil
- Wastage of precious material and metal if not recovered
- Recovery of spare parts for used vehicle market can minimise waste
Uncertain numbers – How many old and end-of-life vehicles?

• Vehicle registration database cumulative -- not corrected for retirement and scrappage. VAHAN data base can help

• CPCB-GIZ study of 2016: More than 87 lakh end-of-life vehicles in 2015. To increase to 2.18 crore by 2025

• India not part of global used vehicle trade; but high level of reuse in domestic market
Age profile of vehicles

In the absence of reliable estimates studies depend on parking lot and fuel pump survey to assess age profile of vehicles.

CPCB 2015 study -- 13% of trucks, 8% of buses, 5% of three wheelers, 3% of cars and 7% of two-wheelers are above 15 years and more.

-- Substantial numbers are in the 10-15 years bracket.

Source: Data compiled and computed based on study: ‘CPCB 2015, Status of Pollution Generated from Road Transport in Six Mega Cities, Central Pollution Control Board, MOEF&CC. March’
Vehicle retirement curve...

If average age of retirement is 20 years and when only 50 per cent of original fleet is left in service -- about 69% of total registered vehicles survive

How much do old vehicles pollute?

- **MoRTH consultation note 2018**: Old commercial vehicles are about 5% of total fleet but contribute nearly more than 65% of vehicular pollution. Pre-2000 commercial vehicles are 10-25 times more polluting than modern vehicles.

- **ICCT study**: In 2011, pre-2003 vehicles were 23% of the fleet but caused half of particulate emissions (ICCT - 2103)

- A vehicle scrappage programme combined with BS VI standards can achieve substantial emissions reduction (ICCT - 2020)

- **IIT Bombay multi-city study 2014**: Pre-2005 vehicles responsible for 70% of total pollution load from vehicles

- Old heavy duty vehicles have high impact in smaller cities and towns; contribution of old diesel cars and two-wheelers vary between 8-23% across cities

Significant emissions gains possible from fleet renewal

- BSI heavy duty vehicle designed to emit 36 times more particulates compared to BSVI vehicle

**PM emission limits for heavy-duty engines (Trucks/Buses)**

- **India 2000**: 36 times higher than BS-VI
- **BS-II (2005)**: 15 times higher than BS-VI
- **BS-III (2010)**: 10 times higher than BS-VI
- **BS-IV (2017)**: 2 times higher than BS-VI
- **BS-VI (2020)**: Base level

**NOx emission limits for heavy-duty engines (Trucks/Buses)**

- **India 2000**: 16 times higher than BS-VI
- **BS-II (2005)**: 14 times higher than BS-VI
- **BS-III (2010)**: 10 times higher than BS-VI
- **BS-IV (2017)**: 7 times higher than BS-VI
- **BS-VI (2020)**: Base level

Source: Compiled from notifications, ARAI emission norm booklet
Junk vehicle policies in India: Evolving

• **Age of vehicles:**
  - Judicial interventions and state government policies can restrict age
  - Sec 59 of the amended CMVA 2019: Provision to fix age, restrict plying of unfit vehicles – but does not specify criteria for defining end-of-life vehicles

• **Scrappage infrastructure:**
  - CPCB Guidelines on environmentally sound facilities for handling processing and recycling ELVs, 2019 (de-pollution, dismantling, shredding, re-processing, recycling, landfill residues etc)
  - MoRTH - Draft Vehicle fleet modernisation programme

• **AIS 129 standards** for manufacturers on reuse, recycling and material recovery from vehicles
Stimulus for green recovery?

- **Fiscal stimulus package** for fleet renewable, economic recovery and emissions gains – Awaited

- Original focus of the MoRTH consultation note was on commercial vehicles especially old heavy duty vehicles - pre-2000

- Initial target reported -- scrap 2.8 lakh vehicles with monetary incentives – to reduce overall cost of new vehicles by about 15%

- Nature and quantum of voluntary incentives from the industry not yet known

- Any other criteria for scrappage – age, merit of fitness, maintenance and emissions performance – Not yet defined…

- Will stimulus prioritise heavy duty vehicles and leverage electric vehicle programme for other segment?
Designing stimulus for impact

How do we learn from the global experience?

• Substantial emissions benefits possible if heavy duty vehicles are prioritised (Eg Carl Moyer programme for HDVs in the US etc)

• Big emissions benefits possible if scrappage for light duty vehicles is exlplicitly linked with electric mobility for green recovery post pandemic (Eg Germany, Spain, Italy, France etc)

• Target well -- Subsidies may go to those who do not need it. Good emissions benefit but weak economic stimulator? (Germany, cash for clunker in the US etc).

Temporary stimulus measures must be leveraged well
Clunker: Towards scrappage infrastructure
Metal recovery

- Huge potential for recycling steel, aluminium and plastics

- FICCI estimates – Possible to recover 8 million tonnes of steel; In 2015-16 auto industry used 10% of steel consumption in the country

- Steel content can be as high as 65-70% in vehicles reaching obsolescence

- India has high import dependency for several key metals; Industry can upscale waste recycling

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<tr>
<th>Economic sector</th>
<th>Selected raw materials (vehicle propulsion-wise)</th>
<th>Import dependency (in percentage)</th>
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<tbody>
<tr>
<td>Automobile sector (inclusive of electric vehicles)</td>
<td>Internal combustion engine vehicles: Steel, copper, aluminium, zinc, nickel, lead, glass, rubber, various plastics/synthetics</td>
<td>Copper (50–60%)</td>
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<tr>
<td>Share in national income (7.1%)</td>
<td>Electric vehicles: Lithium, cobalt, nickel, rare earths, various plastics/synthetics, steel, copper; aluminium</td>
<td>Lithium (100%)</td>
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<td>Cobalt (100%)</td>
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<td>Aluminium scrap (90%)</td>
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<td>Steel scrap (20–25%)</td>
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<td>Lead (75%)</td>
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<td>Rare earths (100%)</td>
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Informal scrapping

- Mayapuri phenomenon – local protests and judicial action
- Efficient system. But not well equipped for de-pollution and environmental safeguards
  - ELV dismantling -- hazardous substances (waste oil, lubricants, lead acid batteries, lamps, electronic components, air bags, etc.)
  - Scrap metals (ferrous and non-ferrous metals)
  - Unusable items such as rubber parts (excluding tires), insulation materials, glasses, etc., - go to landfill
  - Informal reuse/recycling of batteries – formal regulations exist
- How to support common infrastructure for environmental safeguards?
- Informal sector will continue to play important role nationally
- Enforce siting policy
Delhi scrappage policy and formal scrappage facilities

Delhi Guidelines for Scrappage of Motor Vehicle in Delhi 2018 – Important step forward

-- Licensing, inspection of scrappage centres, safe disposal and recovery of scrapped material and waste, facilitate scrapping certificate, camera vigilance of scrapping activity

-- Scrap yards to follow CPCB guidelines for de-pollution, dismantling, shredding, landfill residue, reuse processing, recycling etc

MHI-Natrip demonstration centre in Chennai -- Mahindra, Tata, Toyota establishing scrap facilities under joint venture

Challenge of scale and critical mass for a viable business model

Source: CERO Mahindra
Spare parts serve the second hand market. The green tags have the details of the original vehicle and price.

Source: CERO Mahindra
End-of-life regulations in India – Manufacturer’s role

AIS 129 framed by Automotive Industry Standard Committee in 2015 on reusability, recyclability and recoverability

Minimum 80-85% of material used in vehicles must be recyclable/ recoverable or reusable from end of life vehicles

Restricts use of heavy metals – lead, mercury, cadmium, hexavalent chromium, etc

Coding of plastic component to inform dismantlers

Voluntary action – legally binding?

Industry discussing – recycling infrastructure, end of life vehicle system, vehicle inspection programme
Need stronger ELV programme – missing link in India

Indian regulations not fully aligned with European regulations – How is AIS 129 different?

-- In India 80-85% of mass to be recyclable; In Europe 85-95%

-- Two-wheelers and passenger cars within the scope; But N1 category – goods vehicles excluded in India

-- AIS 129 has not included Extended Producer Responsibility (EPR) – Industry not responsible for recycling its own waste. European regulation include EPR

-- Coding requirements can be expanded to inform dismantling
Sometime questions asked on equity impact of scrappage policy

What about low-income consumers who might want to extend the economic life of old cars?

Global learning curve: Needs more stratified support

California ‘Clean Cars 4 All’ Program –

• The highest incentive under this program goes to lowest income group in disadvantaged community to make them choose the cleanest vehicle technology

• Target groups also have the option to replace their older vehicles for alternative mobility options (eg public transit passes).

• Stratified incentives for the purchase of a new or used plug-in hybrid electric (PHEV), battery electric (BEV), etc; OR, choose up to $7,500 in incentives to access public, private, and shared mobility options.

• (Source: California Air Resources Board, https://ww3.arb.ca.gov/msprog/lct/vehiclescrap.htm)
Reduce emissions and environmental damages from clunkers: Next steps

- For fiscal stimulus package prioritise replacement of heavy-duty vehicles with BSVI vehicles

- If cars and two-wheelers are included, then link scrappage incentive with electric vehicles to enable 30-40% electrification by 2030. Delhi has taken this approach.

- Make CPCB guidelines mandatory; link with National Clean Air Programme; Need composite framework

- Reform and mandate AIS 129 to include ERP, increase recyclability requirements, include goods vehicles within its scope

- Need state level scrappage policy to set clear milestones for scrappage infrastructure

- Lay down criteria for selection of ELVs and unfit vehicles for a national programme; Age cap works in pollution hotspots; Leverage I/C centres and remote sensing

- Build scrappage infrastructure for quality control and material recovery; Integrate informal sector

- Adopt other strategies to discourage old and polluting vehicles – (stronger on-road emissions inspection, low emissions zones, tax measures etc. Clean up vehicle data base