Stopping Clunkers
Roadmap for used vehicle import

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Consultation on Vehicle import policy roadmap for clean air

Centre for Science and Environment

Zanzibar, May 31, 2018
Delhi: November, 2016......
PM2.5 levels in cities of Africa: Exceeding WHO levels by several times

- Cameroon – PM2.5 levels are 13.2 times the WHO standard,
- Uganda -- 10.4 times the WHO standard
- Egypt -- 7.6 times the WHO standard

Source: WHO Air quality database, 2016
Vulnerability of Africa and South Asia
Nigeria has the highest population-weighted annual average PM2.5

Source: The State of Global Air, 2018, Health Effect Institute, USA.
Healthy life years lost due to air pollution in Africa and Asia

• More people falling ill in Africa and losing healthy life years due to air pollution

Source: The State of Global Air, 2018, Health Effect Institute, USA
Very high exposure and health cost in Africa

UN Economic Commission, Africa -- the cost of air pollution in African cities -- as high as 2.7 per cent of GDP.

About 176,000 deaths premature deaths due to air pollution. -- below world average. But increasing

Nigeria -- Little Green Data Book 2015 -- 94 per cent of the population is exposed to PM2.5 levels exceeding WHO guidelines. Air pollution damage costs about 1 percent of Gross National Income.

A study by University of Nairobi: The economic loss per year in Kenya of vehicle emissions and associated air pollution is 115 million KSh from related illnesses and deaths.
Toxic Exposure ....
CSE assessment of exposure to pollution while traveling on roads

Average exposure to PM2.5 ranged between 192 to 642 micrgramme per cum. Peaks as high as 457 to 1170. The average ambient level ranged between 191 to 277.

Source: Based on CSE exposure monitoring and DPCC data for ambient levels.
Early stages of motorisation... Time to be preventive
Car ownership in cities of Africa

<table>
<thead>
<tr>
<th>Country</th>
<th>Vehicles per 1000 people</th>
</tr>
</thead>
<tbody>
<tr>
<td>South Africa</td>
<td>120</td>
</tr>
<tr>
<td>Botswana</td>
<td>90</td>
</tr>
<tr>
<td>Namibia</td>
<td>60</td>
</tr>
<tr>
<td>Nigeria</td>
<td>30</td>
</tr>
<tr>
<td>Ghana</td>
<td>20</td>
</tr>
<tr>
<td>Côte d’Ivoire</td>
<td>15</td>
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<tr>
<td>Senegal</td>
<td>10</td>
</tr>
<tr>
<td>DR Congo</td>
<td>8</td>
</tr>
<tr>
<td>Kenya</td>
<td>6</td>
</tr>
<tr>
<td>Cameroon</td>
<td>5</td>
</tr>
<tr>
<td>Mozambique</td>
<td>4</td>
</tr>
<tr>
<td>Angola</td>
<td>3</td>
</tr>
<tr>
<td>Chad</td>
<td>2</td>
</tr>
<tr>
<td>Ethiopia</td>
<td>1</td>
</tr>
</tbody>
</table>

World average: 

Sources: World Bank (2014a); country communications; IEA databases and analysis.

**Kenya**: Nearly 30% of all vehicles in Kenya in Nairobi. Nairobi’s car fleet to double in just six years.

**Lagos**: If ownership rates grow from 0.05 per capita to 0.06 over the period from 2010 to 2025 there will be 80% increase in vehicles numbers.

**Addis Ababa**: Base numbers are small. Poised for rapid increase.
Top 10 motorised African countries (total number of registered vehicles)

Source: WHO, 2013
Motorization in South Asia

Number of registered vehicles in South Asian countries

![Graph showing registered vehicles in South Asian countries]

Vehicles per thousand population

![Graph showing vehicles per thousand population]


• Sri Lanka has the highest number of cars, with close to 70 vehicles per thousand people, which is higher than India’s at 20 per 1000 people.
Learn from India’s experience

- All Vehicles registered in India (in millions)

Same number of vehicles; 105 million were added in just last 6 years

Took almost 60 years to cross 100 million vehicle mark in India

Source: 2016, Road Transport Yearbook, MoRTH
Build on the inherent strength of Africa and Asia: High usage of public transport, walking ..........

India
- We have built walkable cities:
  - 30-60% trips carbon neutral.

Urban Mobility
PT and NMV based, MTW majority personal vehicles

Africa:
- Majority walk and use public transport

60-30% carbon neutral trips
Increase in PT will increase carbon!

Modal share

City population (million)

Transport modal share of the cities

Based on: International Association of Public Transport (2010) 'Major Trends and case studies'
Where are vehicles coming from?
Global vehicle trade flows from high-income to low and middle income countries of Africa

**Africa:** Target of inter-continental trade

- From over 17 countries
- EU, US, Japan, South Korea and China are the biggest exporters to Africa.
- Two-wheelers come largely from India and China

**South Asia:** Market is more contiguous; trade flows largely from within Asia -- Japan, China, India, South Korea etc
Where are vehicles coming from in Africa?

Total value of vehicle imports in Africa in 2017 (% of value of import)

- Germany: 14%
- China: 14%
- Japan: 10%
- India: 7%
- France: 6%
- United States of America: 5%
- Republic of Korea: 5%
- Spain: 5%
- United Kingdom: 3%
- Belgium: 3%
- Italy: 3%
- Others: 19%

Import to Africa by vehicle segments in 2017 (% of value of import)

**Car imports** in Africa in 2017 (% of value of import)

- Germany 19%
- Japan 13%
- United States of America 8%
- Republic of Korea 8%
- United Kingdom 5%
- Spain 5%
- France 7%
- Czech Republic 3%
- Belgium 4%
- South Africa 3%
- Turkey 3%
- Others 13%

- Germany, Japan, Korea, US, dominate the market

**Two-wheeler imports** in Africa in 2017 (% of value of import)

- China 62%
- India 26%
- Other 6%
- Austria 1%
- Germany 2%
- Japan 3%

- China and India are the biggest exporter of two wheelers

Import to Africa by vehicle segments in 2017 (% of value of import)

**Goods-vehicle imports** to Africa in 2017 (% of value of import)

- South Africa, China and Japan are the major exporters

**Public-transport vehicle** imports to Africa in 2017 (% of value of import)

- Japan, China and India dominates

Where are the vehicles coming from in South Asian countries?

Total vehicle imports in Bhutan in 2012 (% of value of import)

Total vehicle imports in Bangladesh in 2015 (% of value of import)

Total vehicle imports in Sri Lanka in 2016 (% of value of import)

Total vehicle imports in Nepal in 2015 (% of value of import)

Total vehicle imports in Pakistan in 2016 (% of value of import)

### Country-wise and segment-wise import of vehicles
#### Bhutan in 2012

<table>
<thead>
<tr>
<th>Car imports in Bhutan in 2012 (% of value of import)</th>
<th>Two-wheeler imports in Bhutan in 2012 (% of value of import)</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Thailand 16%</td>
<td>- Others 5%</td>
</tr>
<tr>
<td>- Republic of Korea 16%</td>
<td>- China 4%</td>
</tr>
<tr>
<td>- India 46%</td>
<td>- India 91%</td>
</tr>
<tr>
<td>- Japan 21%</td>
<td>- Others 1%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Goods-vehicle imports to Bhutan in 2012 (% of value of import)</th>
<th>Public-transport-vehicle imports to Bhutan in 2012 (% of import)</th>
</tr>
</thead>
<tbody>
<tr>
<td>- India 100%</td>
<td>- Japan 7%</td>
</tr>
</tbody>
</table>

Nepal in 2015

Car imports in Nepal in 2015 (% of value of import)

Two-wheeler imports Nepal in 2015 (% of value of import)

Goods-vehicle imports to Nepal in 2015 (% of value of import)

Public-transport-vehicle imports to Nepal in 2015 (% of import)

Motorisation riding high on old and used vehicles

-- Global vehicle stock 2 billion

-- 40 million a year approaching end-of-life that needs to be scrapped

-- To increase as vehicle stock will double over the next two decades

-- Cheaper price, lower depreciation costs, and rich variety of brands incite this trade from high income to low income countries
Relation between per capita GDP and average age of cars in high-income and low-income countries

Average age of vehicles in poorer countries -- 12-17 years
High income counties – less than 8 years

Source: CSE
Age-based used-vehicle imports by different countries

Source: Based on UNEP report
85-90% of new sales are second hand vehicles

<table>
<thead>
<tr>
<th>Indicator (unit)</th>
<th>Ethiopia</th>
<th>Kenya</th>
<th>Nigeria</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fleet size</td>
<td>587,400</td>
<td>1,300,000</td>
<td>3,590,000</td>
<td>2015</td>
</tr>
<tr>
<td>Sales of new vehicles (per annum)</td>
<td>18,000</td>
<td>19,523</td>
<td>26,400</td>
<td>2015</td>
</tr>
<tr>
<td>Commercial vehicles (% new sales)</td>
<td>16</td>
<td>86</td>
<td>29</td>
<td>2015</td>
</tr>
<tr>
<td>Passenger vehicles (% new sales)</td>
<td>84</td>
<td>14</td>
<td>71</td>
<td>2015</td>
</tr>
<tr>
<td>New vehicles (% new sales)</td>
<td>15</td>
<td>20</td>
<td>10</td>
<td>2015</td>
</tr>
<tr>
<td>Second-hand vehicles (% new sales)</td>
<td>85</td>
<td>80</td>
<td>90</td>
<td>2015</td>
</tr>
<tr>
<td>Motorization rate (per 1000 people)</td>
<td>2</td>
<td>28</td>
<td>20</td>
<td>2014</td>
</tr>
</tbody>
</table>

Age profile of used cars in Ethiopia

Age-wise registered vehicle fleet

Age-wise registered car fleet

Source: CSE analysis of 2014–15 vehicle registration data from Addis Ababa Transport Authority
Weaker environmental safeguards in importing countries encouraging this trade

-- **Minimal domestic policies** on emissions and fuel standards and fuel economy standards.

-- **Constraint of poor fuel quality** does not allow linking of improved vehicle emissions standards with vehicle import

-- 50 ppm sulphur fuels in South and East Africa (11 countries); Opens up the opportunity to link vehicle import with Euro IV emissions standards.

-- **Pressure for cheaper used vehicle blocking improvement** in emissions standards. In West Africa nearly all countries have diesel sulphur in the range of 1,000 - 10,000 ppm.

-- **Even if newer vehicles are imported their emissions deteriorate** as the advanced emissions control systems do not work with high sulphur fuels.

-- **No consumer information about safety, emissions and fuel economy of vehicles**
## Emission standards and fuel-quality standards in South Asia

<table>
<thead>
<tr>
<th>Countries</th>
<th>Fuel quality (sulphur level in fuels)</th>
<th>Vehicle emissions standards</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vehicle-importing countries</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bhutan</td>
<td>50 ppm</td>
<td>TBC</td>
</tr>
<tr>
<td>Pakistan</td>
<td>500 ppm</td>
<td></td>
</tr>
<tr>
<td>Nepal</td>
<td>50 ppm</td>
<td>Euro III</td>
</tr>
<tr>
<td>Sri Lanka</td>
<td>500/800–1000 ppm (local production 3000 ppm) Super-diesel 4 star: 10 ppm (very limited supply in Colombo)</td>
<td>Euro II</td>
</tr>
<tr>
<td>Bangladesh</td>
<td>500–5000 ppm</td>
<td>Euro II for petrol and CNG light-duty vehicles; Euro I for diesel light-duty and heavy-duty vehicles</td>
</tr>
<tr>
<td>Vehicle-exporting country</td>
<td></td>
<td></td>
</tr>
<tr>
<td>India</td>
<td>50 ppm and 10 ppm sulphur</td>
<td>Euro IV emissions standards for all vehicles; 2020: Euro VI emissions standards for all vehicles</td>
</tr>
</tbody>
</table>

**Sources:**


Cheaper used vehicles shifting market towards bigger engines; leading to energy guzzling

Distribution of petrol and diesel cars by engine size in Ethiopia

Source: Addis Ababa Transport Authority
Old and used vehicles emit significantly higher than Euro IV emissions standards

Light duty vehicles with uncontrolled emissions emit more than 8 times the Euro IV standards

Heavy duty vehicles with uncontrolled emissions emit more than 17 times the Euro IV standards

Source: Based on ICCT data
Africa becoming fuel guzzler by default
Comparative average vehicle CO2

Example of Ethiopia compared to other countries

Source: International Council on Clean Transportation
Vehicle importing countries have started to take steps: Lessons
## Vehicle-import regulations in Africa

<table>
<thead>
<tr>
<th>Banned</th>
<th>Restricted by age</th>
<th>Incremental tax or additional excise duty on age</th>
<th>No import restrictions</th>
<th>No punitive import tariffs</th>
<th>No data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Egypt</td>
<td>Algeria</td>
<td>&lt; 3 years</td>
<td>Kenya</td>
<td>&gt; 3 years</td>
<td>Burkina Faso</td>
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<tr>
<td>Morocco</td>
<td>Angola</td>
<td>&lt; 3 years</td>
<td>Cape Verde</td>
<td>&gt; 4 years</td>
<td>Burundi</td>
</tr>
<tr>
<td>South Africa</td>
<td>Chad</td>
<td>&lt; 3 years</td>
<td>Sierra Leone</td>
<td>&gt; 4 years</td>
<td>CAR</td>
</tr>
<tr>
<td>Sudan</td>
<td>Mauritius</td>
<td>&lt; 3 years</td>
<td>Ghana</td>
<td>&gt; 5 years</td>
<td>Cote d’Ivoire</td>
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<tr>
<td></td>
<td>Seychelles</td>
<td>&lt; 3 years</td>
<td>Tunisia</td>
<td>&gt; 5 years</td>
<td>Djibouti</td>
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<tr>
<td></td>
<td>Gabon</td>
<td>&lt; 4 years</td>
<td>Uganda</td>
<td>&gt; 5 years</td>
<td>EQ. Guinea</td>
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<td></td>
<td>Libya</td>
<td>&lt; 5 years</td>
<td>Zimbabwe</td>
<td>&gt; 5 years</td>
<td>Ethiopia</td>
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<tr>
<td></td>
<td>Mozambique</td>
<td>&lt; 5 years</td>
<td>Tanzania</td>
<td>&gt; 8 years</td>
<td>Gambia</td>
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<td></td>
<td>Niger</td>
<td>&lt; 5 years</td>
<td>Cote d’Ivoire</td>
<td>&gt;10 years</td>
<td>Ghana</td>
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<tr>
<td></td>
<td>Tunisia</td>
<td>&lt; 5 years</td>
<td>Gambia</td>
<td>&gt;10 years</td>
<td>Guinea-Bissau</td>
</tr>
<tr>
<td></td>
<td>Cameroon</td>
<td>&lt; 7 years</td>
<td>Liberia</td>
<td>&gt;10 years</td>
<td>Madagascar</td>
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<tr>
<td></td>
<td>Congo</td>
<td>&lt; 7 years</td>
<td>Mali</td>
<td>&gt;10 years</td>
<td>Malawi</td>
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<tr>
<td></td>
<td>Guinea</td>
<td>&lt; 8 years</td>
<td>Rwanda</td>
<td>&gt;10 years</td>
<td>Mali</td>
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<tr>
<td></td>
<td>Lesotho</td>
<td>&lt; 8 years</td>
<td></td>
<td></td>
<td>Somalia</td>
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<tr>
<td></td>
<td>Kenya</td>
<td>&lt; 8 years</td>
<td></td>
<td></td>
<td>South Sudan</td>
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<tr>
<td></td>
<td>Mauritania</td>
<td>&lt; 8 years</td>
<td></td>
<td></td>
<td>Sierra Leone</td>
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<tr>
<td></td>
<td>Namibia</td>
<td>&lt; 8 years</td>
<td></td>
<td></td>
<td>Tanzania</td>
</tr>
<tr>
<td></td>
<td>Reunion</td>
<td>&lt; 8 years</td>
<td></td>
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<td>Togo</td>
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<td></td>
<td>Senegal</td>
<td>&lt; 8 years</td>
<td></td>
<td></td>
<td>Zambia</td>
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<td></td>
<td>Benin</td>
<td>&lt; 10 years</td>
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<td></td>
<td>DRC</td>
<td>&lt; 10 years</td>
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<td></td>
<td>Eritrea</td>
<td>&lt; 10 years</td>
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<td></td>
<td>Liberia</td>
<td>&lt; 12 years</td>
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<tr>
<td></td>
<td>Nigeria</td>
<td>&lt; 15 years</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Swaziland</td>
<td>&lt; 15 years</td>
<td></td>
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</tbody>
</table>

Source: UNEP
Africa: Steps and Lessons

**Uganda** - imposed tax according to the age of vehicles. Environment levy favours import of less than five year old vehicles. Pre-export verification of conformity. Standards specify safety and performance characteristics of vehicles and inspection testing and roadworthiness. Proposing to lower age to 8 years. **But fiscal measures works more as revenue generation action than an effective way of controlling import of old and used vehicles.**

**Mauritius**: Started with CO2 emissions based rebate system and 4 year old age restriction. Underreporting of emissions from used vehicles; increased used vehicle import; Revenue losses; Led to litigation. Replaced with engine size based taxation. 85-90% cars are small cars. Import policy encourage hybrid and electric cars. **Emission based import needs robust system of verification and accountability**

**Nigeria**: Increased import duties on vehicles to promote its vehicle manufacturing and assembly and improve energy security. Result: Car imports dropped by 60% between 2015 and 2016. Banned import of two-stroke engines; higher prices of diesel has prevented dieselisation of cars. **Needs implementation of 50 ppm sulphur fuels and Euro IV emissions standards** Concerns over grey market through Benin.

**Kenya**: A combination of age restriction of 8 years and incremental tax has increased overall price of imported vehicles and reduce demand. **Problem of grey market through its porous borders that often undermines the effort.**
Africa: Steps and lessons

**Ethiopia**: Promoting local assembly of vehicles. But not yet discouraging import of old and used vehicles. Import policy has good elements -- prioritises public transport over personal transport; taxes cars higher. Excise tax increase with engine capacity. **Develop import policy to discourage older vehicles.**

**Ghana**: Higher taxes on bigger engines. Reduced import of very old conventional vehicles and more vehicles less than 10 years are being imported now. Problem of grey market -- provision of ECOWAS protocol that allows import of vehicles for 90 days for other purpose and must be returned or have to pay customs duty that usually does not happen and becomes a loophole.

**Côte d'Ivoire**: Imposed age restriction of 10 years; introduced contributory fee for road safety and action to combat pollution and congestion. **To tighten the age restriction.**

**Zimbabwe**: Not yet imposed age cap; Reduced import duty leading to increase in import of second hand vehicles and discouraged local assembly. New policy to encourage foreign direct investment in the local assembly and manufacturing. **This will require control on import of old and used vehicles.**
South Asia: Steps and lessons

**Bhutan:** Banned second hand vehicles in 1999 except some categories of commercial and emergency vehicles like ambulance, garbage trucks, etc and expats. Higher import duty on bigger engines; Fiscal measures have promoted electric vehicles

**Bangladesh:** Age cap of 5 years and adopted Euro II emissions standards; Needs tighter emissions standards

**Nepal:** Banned used vehicles import; and adopted Euro III emissions standards. Imposes high import duty; promoting electric vehicles; To move to Euro IV emissions standards

**Sri Lanka:** 3 years age cap for cars and two-wheelers; 5 years for commercial vehicles; Differentiated tax: electric – 25%, hybrid – 58%, petrol – 253%, diesel – 345%. Sale of diesel cars have reduced drastically

**Pakistan:** Age limit of 3 years for cars and 5 years for commercial vehicles; Needs to tighten emissions standards. Has the advantage of very high usage of natural gas.
Lesson from Sri Lanka
Import policy has shifted the market from diesel to petrol and hybrids and promoting electric vehicles

Vehicle importing countries have not quantified scrappage requirements

Developing world cannot pass on their old vehicles to anyone else; need to scrap and recycle:

-- In India by 2015 as much as 20 million old vehicles had accumulated that required scrapping

-- Obsolescence rates vary across developing countries; Eg – In India survey shows two-wheeler get obsolete at 10 years, cars at 15 years; commercial vehicles 12 years etc

-- Informal scrappage and recycling efficient but not adequate

-- Scale of the problem will require proper infrastructure for scrappage and recycling for material recovery
What should vehicle importing countries do?

-- Harmonise action on age caps for import, and fiscal measures

-- Tighten and harmonise emissions standards and fuel quality across all countries of Africa

-- Implement vehicle inspection, roadworthiness and safety regulations along with end-of-life and recycling requirements

-- Prevent dumping of dirty diesel

-- Build consumer information system on emissions, safety status of vehicles through labelling and fuel economy

-- Set up vehicle scrappage system to recover material

-- Establish accountability in supply chain;

Learning from Mauritius – Dealers responsible for warranty and repair; Guarantee from certification authority in country of origin (that vehicle has been examined, inspected, not damaged etc before the shipment)
Takes two to tango....

Only unilateral action in vehicle importing countries will not help.... Vehicle exporting countries must also take responsibility
Exporting countries: Used vehicle trade is an incentive to not to scrap older vehicles

-- Used vehicle trade has created stronger incentive for not implementing end-of-life regulations in Europe etc.

-- Useful economic life -- Ricardo estimates – In Europe – 94% of cars have second life; 87% have third life and 27% have fourth life – scrappage rate increases at fourth life

-- Used car export from Germany is two-third of all used car export within European Union. This export declined in 2009 with incentive to scrap old vehicles.

-- More lucrative and cost effective to export old vehicles than scrap and dismantle them. Cannot recover material for recycling from dismantled vehicles within local economy.

-- Netherlands - share of export of end-of-life vehicles have increased over time than these vehicles actually been destroyed.
Exporting countries: Stronger environmental regulations to increase dumping

Stronger measures in high income countries to increase global trade in used vehicles. These measures include:

-- Stringent scrappage and End-of-Life requirements: Needs proof of scrapping. Eg - Europe needed these to be sent to junk yard but no proof of actual scrapping

-- Low emissions zones programmes in Europe that do not allow older vehicles to enter city centres

-- phasing out of diesel cars from European cities.

-- Periodic vehicle inspection programme for on-road vehicles very expensive; vehicle owners prefer to sell older cars. Eg Shaken programme in Japan
Deal with clunkers; stop the hazard

-- Strengthen recycling and reuse policies within the economy to avoid dumping of clunkers.

-- Need internationally agreed common framework of indicators to monitor the global trade in used vehicles.

-- Influence trade forums (WTO), regional trade blocks, UN multilateral forums, country blocks including G8, G 20, BASIC etc -- Develop oversight, guidance and rules to establish accountability and responsibility of exporting countries

-- Support importing countries for on-road monitoring of emissions, disposal of vehicles and recovery of material for recycling.

-- Need stringent verification of safety, emissions, and road worthiness.

-- Extended Producer Responsibility requires manufacturers to take responsibility of take-back, recycling and final disposal of their vehicles within domestic economy. Reinvent this for global supply chain.
Thank You