Clean & Efficient Vehicle Policy For Bangladesh

By
BUET AUTOMOBILE CLUB
Our Activities:

Auto-Fest

Competitions

Yearly Magazine

Projects
The BRTA Session
Emission Norms For IC engines

- Carbon Monoxide (CO)
- Nitrogen Oxides (NO\(_x\))
- Sulfur Oxides (SO\(_x\))
- Unburned Hydrocarbons (HC)
- Particulate Matters (PM)

The GOAL

- Control Pollution
- Increase Efficiency

Source of Various Pollutants
A typical vehicle emission control strategy:

Vehicle Technology + Fuel Quality → Emission Standard Implementation
The Current Technologies Available To Reduce Emission

- **CO** (From exhaust)
- **O₂** (Unused)
- **Catalysts** (Fixed metal matrix)

**CO₂**

* Catalytic Converter
  * We Already Have It!!
The Current Technologies Available To Reduce Emission

- For EURO IV fuel

Exhaust Temperature

NOx

PM

Most feasible for Bangladesh

Diesel Particulate Filter (DPF)

Exhaust Gas Recirculation (EGR) System
The Current Technologies Available To Reduce Emission

Selective Catalytic Reduction (SCR) System

An alternative to EGR system

- Used instead of EGR system in EURO IV vehicles

NOx ↑ PM ↓

Ad-Blue
Use of EGR and SCR systems simultaneously
**Diesel Particulate Filter (DPF)**

- Capture PM and burn them periodically

  The controlled burning process

  Regeneration

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**Continuously Regenerating Technology (CRT)**

- Optional attachment with DPF
- Situated before catalytic converter and SCR system
What’s Our Problem??

High Sulphur Content In Fuel

Production of SOx
Increase of PM

Reduction Of Sulphur Content With Cleaner Emission Norms

<table>
<thead>
<tr>
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<th>Euro-2</th>
<th>Euro-3</th>
<th>Euro-4</th>
<th>Euro-5</th>
<th>Euro-6</th>
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<tbody>
<tr>
<td>Maximum Sulfur Content in Diesel (PPM)</td>
<td>500</td>
<td>350</td>
<td>50</td>
<td>50</td>
<td>10</td>
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In Bangladesh Current Level of Sulphur Content In Diesel

500PPM

Bangladesh EURO II
High Sulphur Content in Fuel

Clogging of DPF and CRT systems

Damage of EGR System

Production of $SO_x$

Increase of PM

HSD - High Sulphur Diesel

EURO IV is hardly possible!!

We need “Hydro-treating unit” in the refinery plant

This requires investment from government
Hypothetical Timeline Goal for Reducing Sulphur Content Level in Diesel
Hypothetical Investment Requirement
For 3 step Sulphur Content Reduction Plan

![Graph showing required investment over time for a three-step sulphur content reduction plan. The investment increases over the timeline, with bars representing the required investment in each phase and a line showing the cumulative investment.](image-url)
Jumping up to EURO IV from EURO III:

**EGR vs SCR**

In case of EGR System:
- Less electronic control interference
- Less skill of drivers and mechanics required
- Easy to maintain
- No requirement of “Ad-Blue”
- Less efficient
- Frequent engine-oil change is needed

In case of SCR System:
- More electronic control interference and use of sensors
- More skill of drivers and mechanics required
- High maintenance
- Requirement of “Ad-Blue”
- More efficient
- No need for frequent engine-oil change
Policy Suggestions For Emission Norm Goal:

✓ Adopting EURO emission standard as a base for Bangladesh Emission Norms

✓ Setting a short and practical deadline

✓ Introducing Low Sulphur Diesel (LSD) in market by upgrading Refinery Plants

✓ Availing LSD, regarding vehicle technologies should be introduced

✓ Registration of lower-emission norm vehicles should be banned
Policy Suggestions For Emission Norm Goal:

✓ During the time lapse between EURO III TO EURO IV, trainings and facilitations should be done for SCR technology.

✓ Ad Blue production plants should be established with Urea, locally found.

✓ Just like India, EURO V stage can be skipped.
The Next GOAL

Hybrids and EVs

Already enjoying Taxation Benefit

Our Proposals:

▪ Power generation and Gridline improvement
▪ Electric bus for public transportation
▪ Battery manufacturing
▪ Battery recycling
▪ Improvement of auto-rickshaws (tri-cycles)

Industrial policy

Long Term Plan

Still Not Getting License
Electric Bus For Efficient Public Transport System

- Zero pollution
- Very quiet.
- Less maintenance requirement.
- Energy efficient in start-stop situations of congested roads.
Next Target  Revision In Taxation Policy

Vehicles According to origin
- CKD (Completely Knocked Down)
- CBU (Completely Built Unit)

Reconditioned (Poor emission)  
Brand New

Policies We Suggest:
- Taxation advantage for brand new CKD vehicles
- Facilities for establishing vehicle assembly plant
- Emission dependent road tax policy
- Increase taxation for reconditioned vehicles
Finally

Possibilities of Alternative Fuel

Mainly CNG is common now
Clean and eco-friendly

Problems with CNG:

➢ Lack of proper engine technologies.
➢ Degrades engine condition.
➢ Significant drop in power.
➢ Not suitable for Compression Ignition (CI) engines.
➢ Limited reserve.
DME As An Alternative Fuel For Bangladesh

- Can be produced from a variety of bio-based materials
- High well to wheel efficiency
- Clean combustion
- Excellent diesel cycle fuel
Thank You!