Rwanda Standards Board (RSB)
Reducing vehicle emissions through standards

Overview

The government of Rwanda is committed to taking urgent actions to mitigate and adapt to the effects of climate change. As a Party to the United Nations Framework Convention on Climate Change (UNFCCC), the country seeks to contribute to the ambitious goal of limiting temperature rise to 2 °C, with efforts to reach 1.5 °C, agreed under the Paris Agreement.

For Rwanda, a country that is deemed highly vulnerable to climate change, adaptation is a key concern and a priority. As is true of most African nations, Rwanda’s contribution to climate change in the form of greenhouse gas (GHG) emissions is relatively small, yet emissions from deforestation, agriculture and land use, combined with the emissions growth expected from economic development and energy use, are significant enough to demand a mitigation response.

In order to mitigate climate change challenges, the government of Rwanda has put in place and is implementing various policies, laws, strategies, regulations, standards and conformity assessment tools in the aforementioned contributing sectors. These policies, standards and regulatory tools were also aligned with the ambitious goal of limiting temperature rise to 2 °C, with efforts to reach 1.5 °C, agreed under the Paris Agreement. This case study highlights what is being done in the transportation sector, focusing on the development of standards for vehicle emissions reduction.

It is worth noting that Rwanda’s transport sector is dominated by land transport due to the improved national and district road network and increased investment in public transport. With growing demand for travel, the number of vehicles has increased dramatically. Based on registrations, total vehicle numbers are estimated to have grown from 47,631 in 2006 to 161,925 in 2015, representing an increase of over 300%. Motorcycles accounted for around 51% of total vehicles in 2015, followed by passenger cars (34%) and other vehicles including buses and trucks (15%).

The rise in vehicle emissions prompted the government to put in place policies and regulations aimed at reducing imports of used cars and encouraging the introduction of electric vehicles since 2020 as part of the Rwandan e-mobility programme and mandatory yearly vehicle inspection. Other key transport strategies include using buses as part of public transport, replacing minibuses with modern buses and promoting mass rapid transportation.
Different standards supporting the initiative in the transportation sector have been developed to reduce the emission of pollutants, including NOx, PM\textsubscript{10}, and PM\textsubscript{2.5}, CO and unburnt hydrocarbons. These include RS 407-1:2019, *Emission limits – Specification – Part 1: Road vehicles*, and RS 407-2:2019, *Emission limits – Specification – Part 2: Non-road mobile machinery*. The purpose of developing these standards was to ensure minimum emissions in the transport sector. In addition to these performance evaluations of vehicles and mobile machinery, standards were developed in 2019 on fuels including gasoline (RS EAS 177) and diesel (RS EAS 158) to accelerate the introduction of new cars with advanced engine technologies.

A number of stakeholders were involved in this study, including:

- **Policy makers**: Ministry of Environment (MoE), Ministry of Infrastructure (MININFRA), Ministry of Trade and Industry (MINICOM)
- **Regulators**: Rwanda Utility Regulatory Agency (RURA), Rwanda Environment Management Authority (REMA)
- **Inspectors**: Rwanda National Police (RNP)
- **Policy implementers**: Energy Development Corporation Ltd (EDCL), Rwanda Transport Development Agency (RTDA)
- **Vehicle manufacturers**: Volkswagen Rwanda, SAR Motors
- **Academia**: College of Science and Technology (UR-CST), Integrated Polytechnic Regional College (IPRC) Kigali
- **Garage owners**: TUMECO Garage, Metropole Motors, PurePro® Ltd, Rwanda Garages Association (RGA)
- **Vehicle importers**: Akagera Motors
- **NGOs**: Standards for Sustainability (Sfs), Rwanda Environment Management Company (RWEMACO)
- **Rwanda Consumer Association**
- **Others**: Real Contractors Ltd, Sulfo Industries Rwanda

**Outcomes and benefits**

*How standards address the issue:*

The standards provide new stringent requirements compared to existing requirements used by inspectors of vehicles (Rwanda National Police). The majority of imported cars in Rwanda were used vehicles with old technology engines that consume a lot of fuel and emit enormous gases, including GHG. In order to cut down vehicle emissions, Rwanda has now embarked on a journey to phase out the use of vehicles manufactured with old technology and adopt current technologies that are fuel-efficient and less emitting.

Standards for road vehicle emission limits are used by the Rwanda Motor Vehicle Inspection Center to control/measure the emissions and road worthiness of vehicles, either imported new/used or already in use on Rwandan territory. This supports the implementation of the country’s air quality policy.
In addition, fuel standards have enabled the implementation of the Rwandan policy strategic plan for phasing out old vehicles and introducing new vehicles with engine technology of at least EURO 4 generation.

### Overview of new fuel standards in Rwanda

<table>
<thead>
<tr>
<th>Existing requirements</th>
<th>New requirements from RS 407-1:2019</th>
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<tbody>
<tr>
<td>For in-use motor vehicles that are equipped with a spark ignition engine (gasoline), the acceptable ranges for emissions are:</td>
<td>For in-use motor vehicles that are equipped with a spark ignition engine (gasoline), the standards required for a manufactured vehicle are:</td>
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<tr>
<td>• CO: 0-15 % Vol. / 0.01</td>
<td>• After 2005: HC: 400 ppm, CO: 1 %</td>
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<tr>
<td>• CO₂: 0-20 % Vol. / 0.01</td>
<td>• Between 1992 and 2004: HC: 500, CO: 3 %</td>
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<tr>
<td>• HC: 0-9999 ppm / 0.1</td>
<td>• Before 1992: HC: 600 ppm, CO: 4.5 %</td>
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<tr>
<td>• O₂: 0-25 % Vol. / 0.01</td>
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<tr>
<td>For in-use motor vehicles that are equipped with a compression ignition engine (diesel), the acceptable ranges for emissions are:</td>
<td>For in-use motor vehicles that are equipped with a compression ignition engine (diesel), the standards required for a manufactured vehicle are:</td>
</tr>
<tr>
<td>• Opacity: 0 to 5(^{m^{-1}}) effective</td>
<td>• After 2005, the following acceptable ranges: opacity: less than 1.5 M(^{-1})</td>
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<tr>
<td>If opacity is greater than 5(^{m^{-1}}), the engine is defective.</td>
<td>• Between 1992 and 2004, the following acceptable ranges: opacity: less than 2.5 M(^{-1})</td>
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**Relationship between standards and policy/regulation:**

The standards on fuels and vehicle emissions serve as the basis for the conformity assessment of imported fuels and inspection of vehicles, either imported new/used or already in use on Rwandan territory. The implementation of these standards supports policy actions stipulated above and especially the air quality policy.

**How standards fit within the framework of existing or new regulation/legislation:**

The standards have integrated successfully with the existing legal framework:

- They have helped set the requirements for inspection for all vehicles imported and already in-use on Rwandan territory.
- They have enabled the adoption of new technologies that use fuel efficiently and are less emitting.
- All imported vehicles are currently manufactured with at least EURO 4 technology.
Partners involved

**Requesting organization:**
- Ministry of Environment via the Rwanda Environment Management Authority (REMA)

**Supporting organizations:**
- United Nations Environment, Climate and Clean Air Coalition (CCAC)
- Environmental Compliance Institute (ECI)

The above organizations partnered with the Rwanda Standards Board (RSB) in the development of minimum-allowed emissions of on- and off-road vehicles.

**Timeline**

The initiative for lower transport emissions was launched in May 2018 and included the development of motor vehicle emissions and fuel standards. These were published in 2019 after 16 months in the making.

**References**
- REMA, *Inventory of Sources of Air Pollution in Rwanda*, 2018
- Updated Nationally Determined Contribution (May 2020)
- National Environment and Climate Change Policy, 2019
- *Green Growth and Climate Resilience Strategy*, 2011
- Air Quality Law, 2016
- ISO 14064 (series), *Greenhouse gases*