KENYA

SHIFTING TO CLEANER AND MORE FUEL-EFFICIENT VEHICLES

THE GFEI IS SUPPORTED BY:

GLOBAL FUEL ECONOMY INITIATIVE

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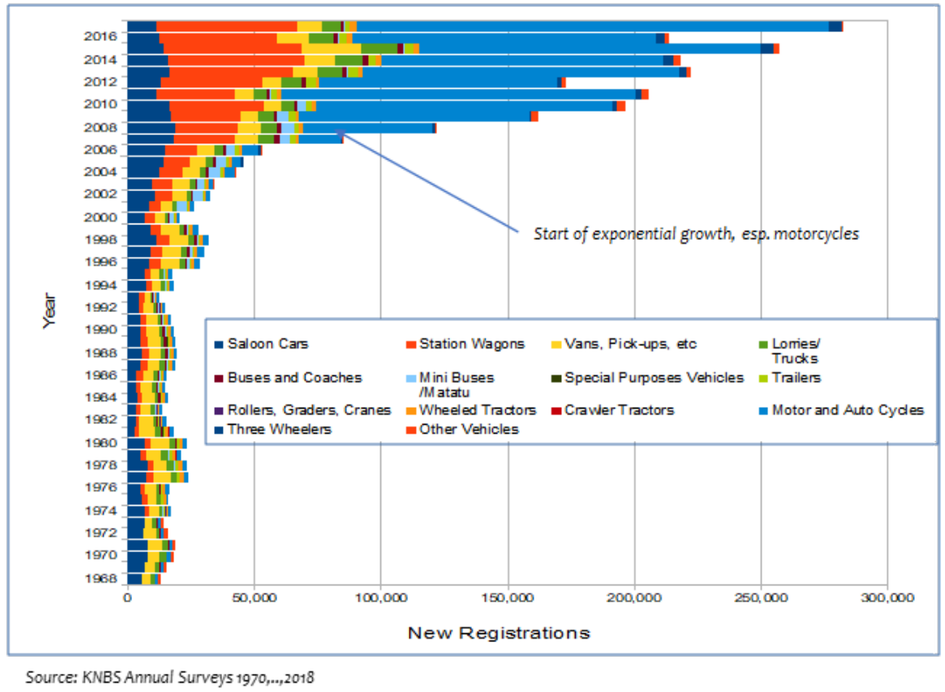
Background

Figure 1 below shows additional vehicle fleet in Kenya from 1968 -2017. From the mid-2000, an exponentially high growth rate in the number of two-wheeler motorcycles and station wagon vehicles is observed. These are mainly used to transport people and goods. Hence any policy interventions in the country needs to also target these two vehicle types.

Figure 1: Newly Registered Vehicles by Year and Category from 1968-2017



Source: KNBS Annual Surveys 1970,..,2018

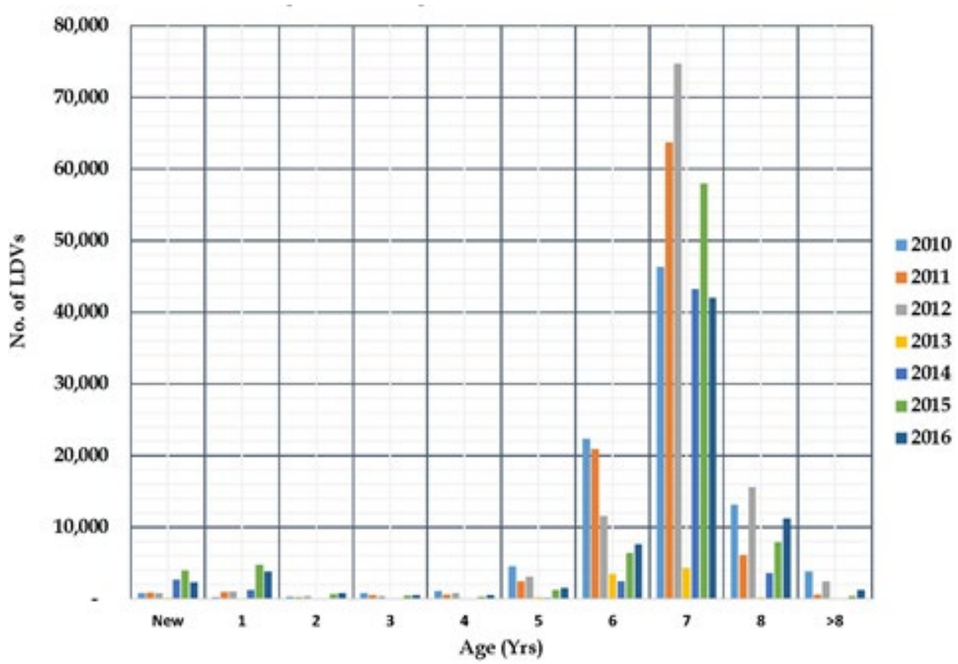
Kenya predominately imports used light duty vehicles as shown in Table 1.

Table 1: New and Used LDV population

YEAR	2010	2011	2012	2013	2014	2015	2016	GRAND TOTAL	
									%
New	728	1,032	1,212	290	3,750	3,941	2,285	**13,238**	**2.5**
Used	92,410	95,452	109,260	8,028	49,390	79,770	68,889	**503,199**	**97.5**
Total	93,138	96,484	110,472	8,318	53,140	83,711	71,174	**516,437**	**100**

The bulk of vehicles imported into the country are on average 7 years due to a maximum import age restriction of 8 years as shown in Figure 2 below.

Figure 2: Kenya's Vehicle Registration by Age from 2010-2016

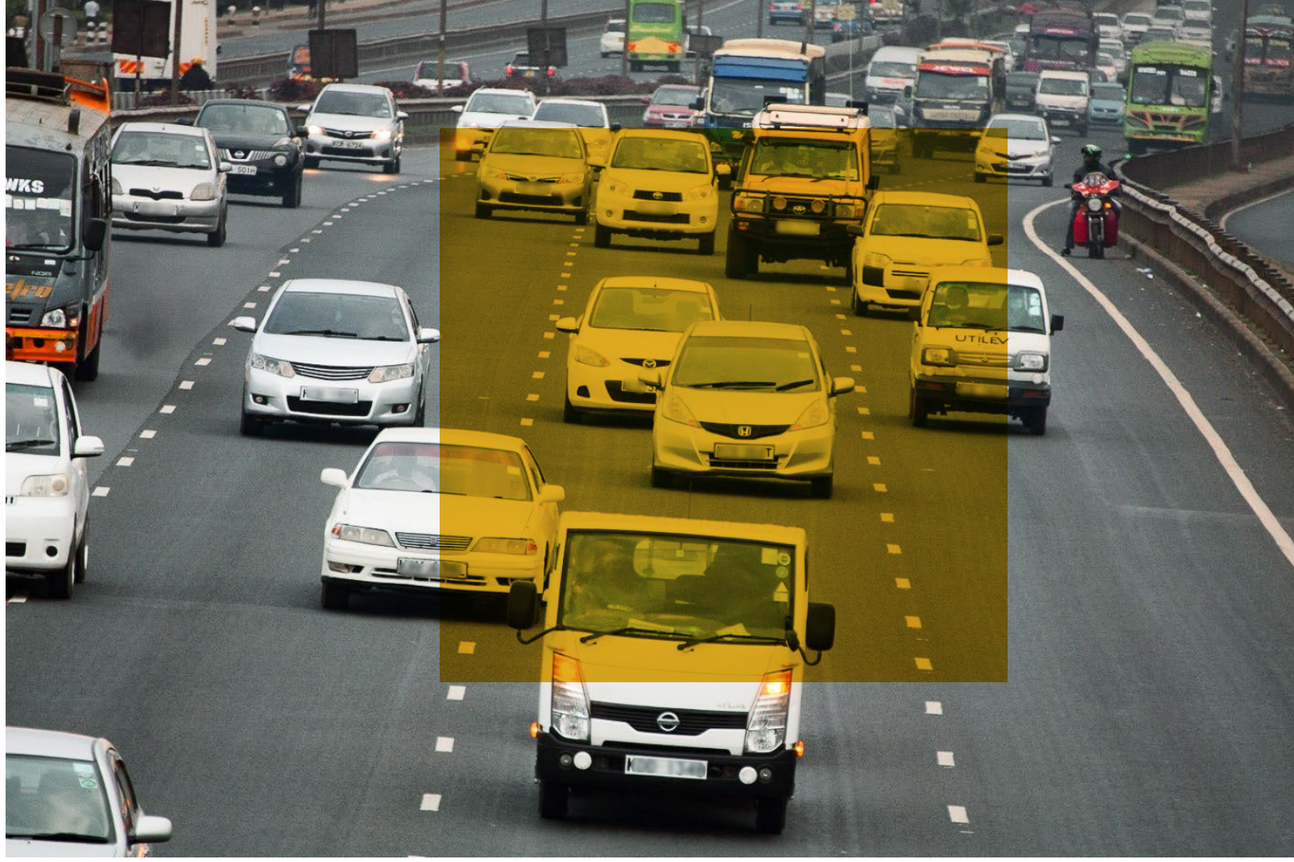


At the same time, petrol cars dominating the market as shown by Table 2.

Table 2: Percentage of LDVs by fuel type in Kenya

Fuel Type	2010	2011	2012	2013	2014	2015	2016	GRAND TOTAL
Diesel	16.36	13.58	12.04	17.89	10.31	21.43	21.65	**16.18**
Petrol	83.62	86.42	87.96	82.11	89.62	78.57	78.35	**83.81**
Grand Total	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**

In 2011, to support Kenya to assess the quality and fuel economy of additional vehicle fleet in the country, the United Nations Environment Programme (UNEP) engaged Climate XL Africa, a non-governmental organization, to develop a methodology to analyze vehicle fuel economy in Kenya and other in developing and transitional countries. This was necessary because most developing and transitional countries imported used vehicles information on their average fuel consumption and CO2 emissions is not included at the time of registration.



It was agreed that where information was available, the year 2005 would act as the baseline year, from which subsequent fuel economy trends would be analyzed. A methodology to analyze the average fuel economy levels in the countries was developed and agreed on with GFEI partners. Kenya's fuel economy baseline and 2008 average levels were estimated – see Table 3.

Table 3: Fuel Consumption by Year and Fuel Type

	2005	2008
Average (l/100km)	7.69	7.6
Diesel	8.67	9.09
Petrol	**7.52**	**7.2**

Follow up studies were carried out in partnership with the Energy Regulatory Commission (now Energy and Petroleum Regulatory Authority) and the University of Nairobi for vehicles imported into the country in 2010 – 2012, and 2013 – 2016, and policy proposals to support importation of cleaner, more fuel economy vehicles prepared.

Key Fuel Economy Findings

From the GFEI studies, below are the average fuel consumption and CO2 emission levels for LDVs imported into the country. The fuel economy of petrol cars, although better, is still above global average fuel consumption levels, while that of diesel vehicles is worse as shown in Table 4. This can be explained by the import of bigger diesel engine SUVs. Kenya like other African countries, is not incentivizing the import of the most efficient cars in the market today. The average fuel consumption of vehicles imported in 2016 for example was 7.3 Litres/100km compared to the EU which had an average fuel consumption of 5.4L/100km in the same year.

Table 4: Average Fuel Consumption (L/100km) and CO2 Emission (g/km)

Year of vehicle registration	Fuel Type			
	Diesel	Petrol	Average Fuel Consumption Metric combined(L/100km)	Average CO2 emission(g/km)
2010	8.0	7.2	7.4	178.2
2011	7.9	7.5	7.6	182.0
2012	8.0	7.6	7.7	185.4
2013	8.1	7.5	7.5	178.0
2014	8.2	6.6	6.7	160.0
2015	8.3	7.1	7.4	179.6
2016	8.4	7.0	7.3	178.3

The average fuel consumption in 2010 - 2012 was 7.5 Litres/100 Kilometers with average CO2 emissions of 181.7g/km. There was however a slight improvement in average fuel consumption between 2015 and 2016 to 7.4 and 7.3 L/100km respectively. This could have been occasioned by an increased preference for lower engine capacity vehicles at 1301-1500cc as shown in the graph below.

Figure 3: Registration of LDVs by engine displacement and fuel types

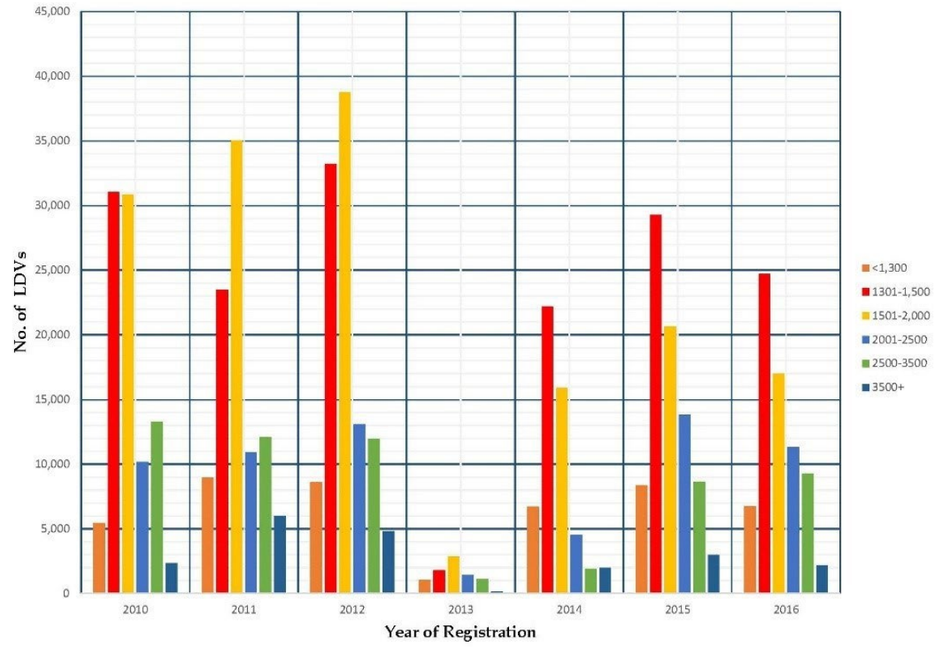


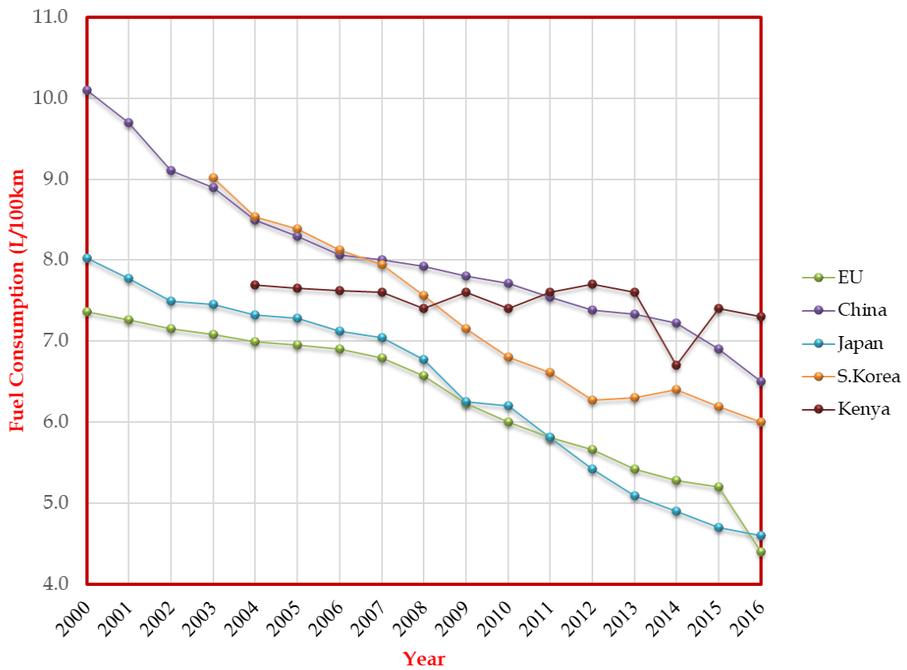
Table 5 below further collaborates the fact that fuel consumption or economy of vehicles is influenced by the engine displacement.

Table 5: Fuel Consumption (L/100km) for diesel and petrol Engines.

Engine Displacement	Diesel							Petrol						
	2010	2011	2012	2013	2014	2015	2016	2010	2011	2012	2013	2014	2015	2016
0-1000	0.0	5.5	0.0	5.5	0	5.7	0.0	5.9	0.0	4.6	4.3	5.2	4.3	5.2
1001-1300	6.7	6.3	7.1	6.5	6.4	6.7	0.0	6.3	0.0	5.8	4.2	5.9	4.2	5.8
1301-1500	6.6	6.3	6.3	6.5	6.4	6.5	0.0	6.3	4.7	6.5	4.9	5.8	4.6	5.7
1501-2000	7.3	7.2	6.9	7.2	6.8	7.2	7.1	7.4	8.5	7.0	7.0	7.6	7.1	7.4
2001-2500	7.7	7.6	7.8	7.8	7.8	8	7.7	7.9	8.2	8.9	8.4	9.3	8.3	9.3
2500-3500	8.1	8.5	7.9	8.8	8.1	8.8	8.1	8.7	8.9	9.2	9.2	11.8	9.3	11.3
3500+	9.6	13.2	9.9	13.7	9.8	13.6	9.4	12.1	11.1	11.2	10.5	12.9	10.5	12.2

While figure 4 below compares Kenya's average fuel consumption with that of selected countries, specifically where Kenya imports most of her vehicle fleets.

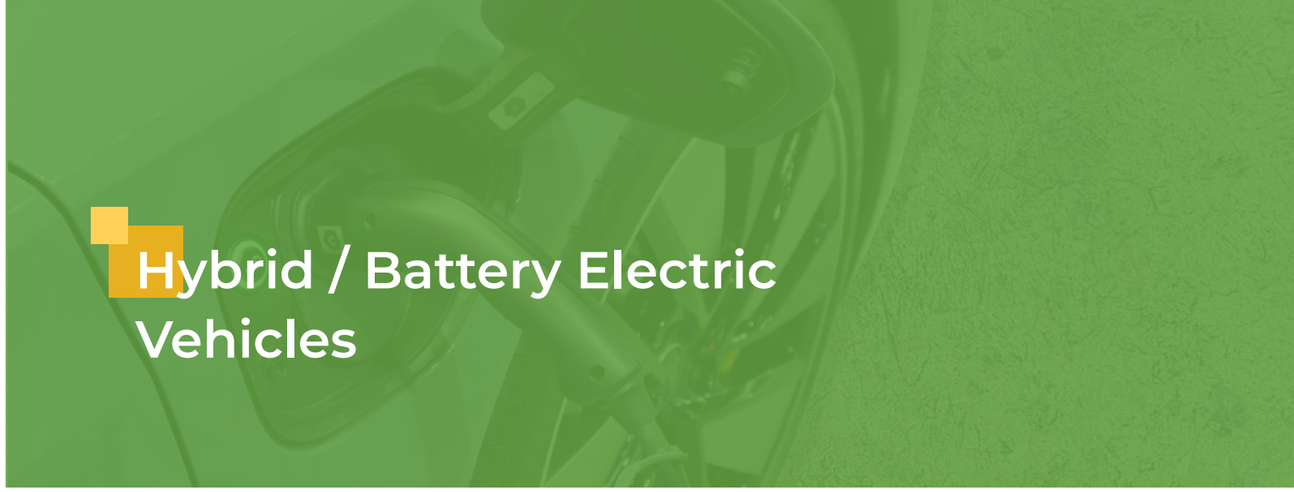
Figure 4: Average Fuel Consumption in L/100km for a selected group of countries



Kenya's LDV population is projected to reach about 4 million by 2030 based on previous trends where the vehicle population almost doubles every 10 years or so as estimated in Table 6.

Table 6. Cumulative Total Vehicle Registrations: Observed and Predicted Values

YEAR	STATUS	CUMULATIVE VEHICLE REGISTRATIONS
2008	Actual	1,297,520
2009	Actual	1,454,249
2010	Actual	1,651,257
2011	Actual	1,849,911
2012	Actual	2,022,955
2013	Actual	2,031,273
2014	Actual	2,084,413
2015	Actual	2,168,124
2016	Actual	2,239,298
2030	Predicted	3,862,570
2050	Predicted	6,181,266



Hybrid / Battery Electric Vehicles

The country has also seen a slow uptake of electric passenger cars, as by 2019, only about 350 electric vehicles had been registered in the country. Table 6 below depicts the low registration rate despite the potential advantage in better fuel economy and lower CO2 emissions. Between 2014 and 2016, only 214 hybrid electric vehicles had been registered in the country. This represented only 0.001% of LDV's registered during the same period.

It is presumed that this could be due to a combination of factors - from lack of knowledge on the benefits of electric vehicles, to perceived range anxiety and limited charging infrastructure. The use of incentives by government to encourage uptake of hybrid and battery electric vehicles has been practiced widely in the developed world. In 2019/20 the government reduced excise duty for electric vehicles to 10% to provide incentives for the purchase of electric vehicles. An amendment to introduce a graduated excise tax for the internal combustion engine based on engine capacity was also proposed to provide incentives for more fuel-efficient vehicles.

Table 6: Total Registered LDVs (2010-2016) by Fuel Type

Fuel Type	2010	2011	2012	2013	2014	2015	2016
Diesel	15,234	13,106	13,300	2,651	1,954	17,952	15,404
Hybrid	40	22	26	1	52	67	95
Petrol	77,862	83,356	97,148	38,244	51,146	65,683	55,659
Total	**93,136**	**96,484**	**110,474**	**40,896**	**53,152**	**83,702**	**71,158**

Source: KNBS 2017

Proposed policies to improve fuel economy

From the GFEI study, the following policy interventions were proposed for consideration:

- A graduated Carbon Tax: the study proposes a graduated Carbon Tax as shown in Table 7 that follows the example of the United Kingdom's "Vehicle Tax" where the tax rate starts low or at zero and increases in steps with higher g/CO2 per kilometre. The advantage of basing the tax on g/CO2 is that it provides for broad range of possibilities in improving fuel efficiency and provides incentives for motorists to keep reducing the g/CO2 per kilometre even for vehicles that are fuel efficient.

Table 7: Graduated Taxes on g/CO2 per Kilometre

g/CO² Emission (g/km CO²)	Petrol and diesel cars Carbon Tax (Kshs per g/km CO²)	Alternatively fuelled cars Carbon Tax (Kshs per g/km CO²)
0	0.00	0.00
1 - 50	100.00	90.00
51 - 75	120.00	100.00
76 - 90	144.00	120.00
91 - 100	172.80	144.00
101 -110	207.40	172.80
111 - 130	248.85	207.40
131 - 150	298.60	248.85
151 - 170	358.30	298.60
171 - 190	430.00	358.30
191 - 225	516.00	430.00
226 - 255	618.00	516.00
Over 255	743.00	618.00

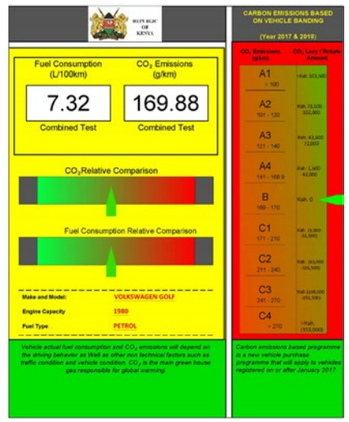
Source: *GFEI Study*

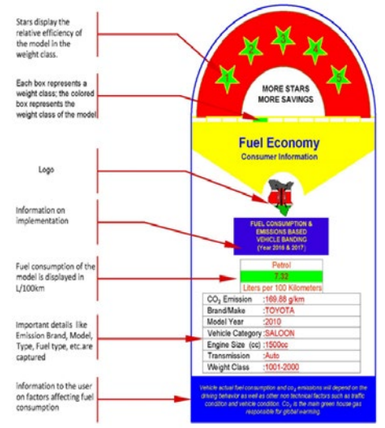
- Alternatively, a revenue neutral fee and rebate system was proposed where a fee would be charged for every gram above a benchmark CO2 range. Vehicles emitting less CO2 than this band would get a rebate. A proposed non continuous rate was determined through analysis of 5 years of vehicle registration data and revenues for the same period. Such a scheme would need to be progressively reviewed to ensure revenue neutrality.

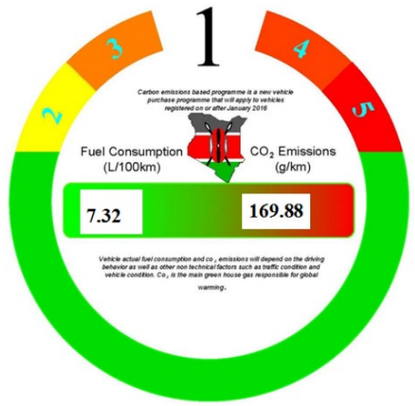
- Development of additional policies to promote the uptake of electric vehicles in order to achieve the 4.2 L/100km as projected in 2030.

- Development of a consumer-focused website to provide consumers with downloadable vehicle detailed information, with access to tools, applications and social media. The online database could be created by the KEBS where vehicle buyers and Auto dealers can log in to access vehicle information.

- A mandatory fuel economy label. A labeling program integrating all classes of vehicles will encourage consumers to purchase vehicles with better fuel economy regardless of the size or type of vehicle. Fuel efficiency labels are displayed on windows of vehicles for sale at dealerships. See example of the proposed labels are shown below.







Conclusion

A key priority for the government to promote cleaner and more fuel economy vehicles could start with incentives to shift to electric 2&3 wheeler motorcycles. These technologies are already widely available and cost-effective, and when linked to renewable energies and battery swapping schemes, could be widely adopted. Another segment would be to promote low carbon public transportation. The private sector is also taking the initiative use cleaner and more fuel economy vehicles in their operations, for example some taxi companies are only operating with electric vehicles. Government policy, additional incentives, consumer outreach and investment in requisite infrastructure will shift consumer choices towards cleaner and more efficient vehicles, including electric vehicles. Finally, for in-use vehicles, mandating regular inspection and maintenance will address increasing vehicle emissions as well as improve road safety.

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