FUEL ECONOMY LABELING
AND
FEEBATE STUDY
FOR
MOTOR VEHICLES IN KENYA

12th May 2016

INTRODUCTION: GFEI KENYAN PILOT PROJECT

- In July 2013, University of Nairobi Enterprises and Services (UNES) consultancy was commissioned by ERC to conduct the GFEI study in Kenya for the 2010-2012 period.

- The study is to support the government of Kenya in the development of a cleaner, more efficient vehicle strategy, policy package and timelines for implementation.

- The study was based on a rigorous process of compiling , analyzing and synthesizing vehicle inventory for the period.

T.O.R. OF THE GFEI KENYAN PILOT PROJECT

- Develop vehicles inventory for Kenya during the 2010-2012 period and assess the trend in average fuel economy and CO_2 emissions.

- Review existing National regulations/incentives to promote cleaner and fuel efficient vehicles.

- Establish the amount of green house gas emissions and the related social and health costs.

- Conduct a cost benefit analysis of various policy interventions / scenarios.

VEHICLE INVENTORY 2010-2014

VEHICLE REGISTRATION DATA AND PROJECTIONS

Year	2010 (Actual)	2011 (Actual)	2012 (Actual)	2013 (Actual)	2014 (Actual)	2030 (Projected)	2050 (Projected)
Light Duty Vehicles	93,136	96,484	110,474	94,017	102,606	307,445	518,025
Cumulative (All vehicles in Millions)	1.65	1.85	2.02	2.2	2.5	5.0	8.0

GFEI 50 X 50 TARGETS.

| Year	Item	L/100Km
2005	Global Average	8.07 L/100km (12.4 Km/L)
2030	Global Average, all new cars	4 L/100km (25km/L)
2050	Global Average, All cars.	4 L/100km (25 km/L)

Fuel Economy and CO_2 emission standards

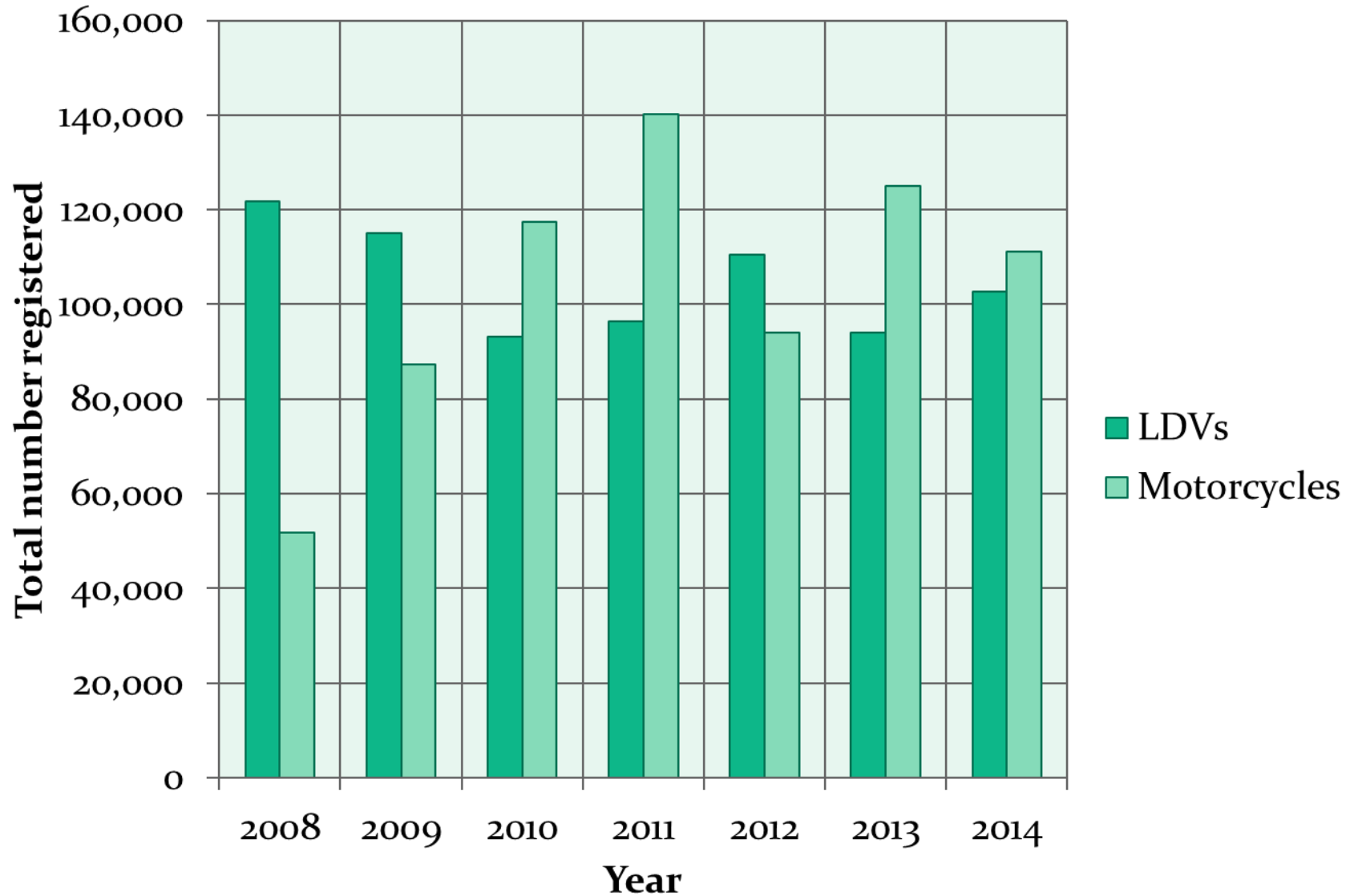| Year	Average fuel Consumption Metric combined(L/100Km)	Average CO_2 emission (g/Km)
2010	7.4	178.2
2011	7.6	182.0
2012	7.7	185.4
Grand Average	7.5	181.7

Registration of Vehicles by Year of Production
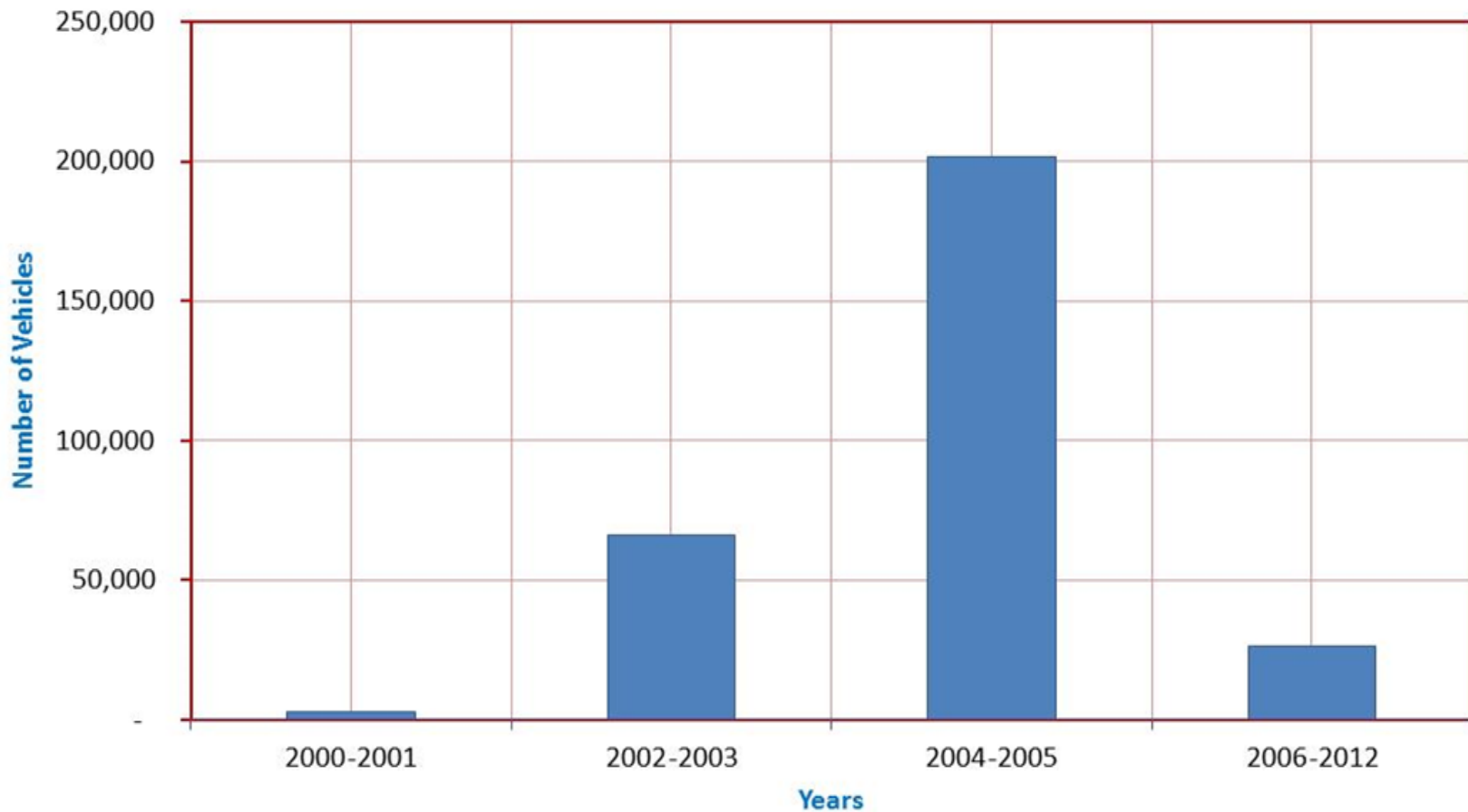
Comparison of L/100km with selected countries
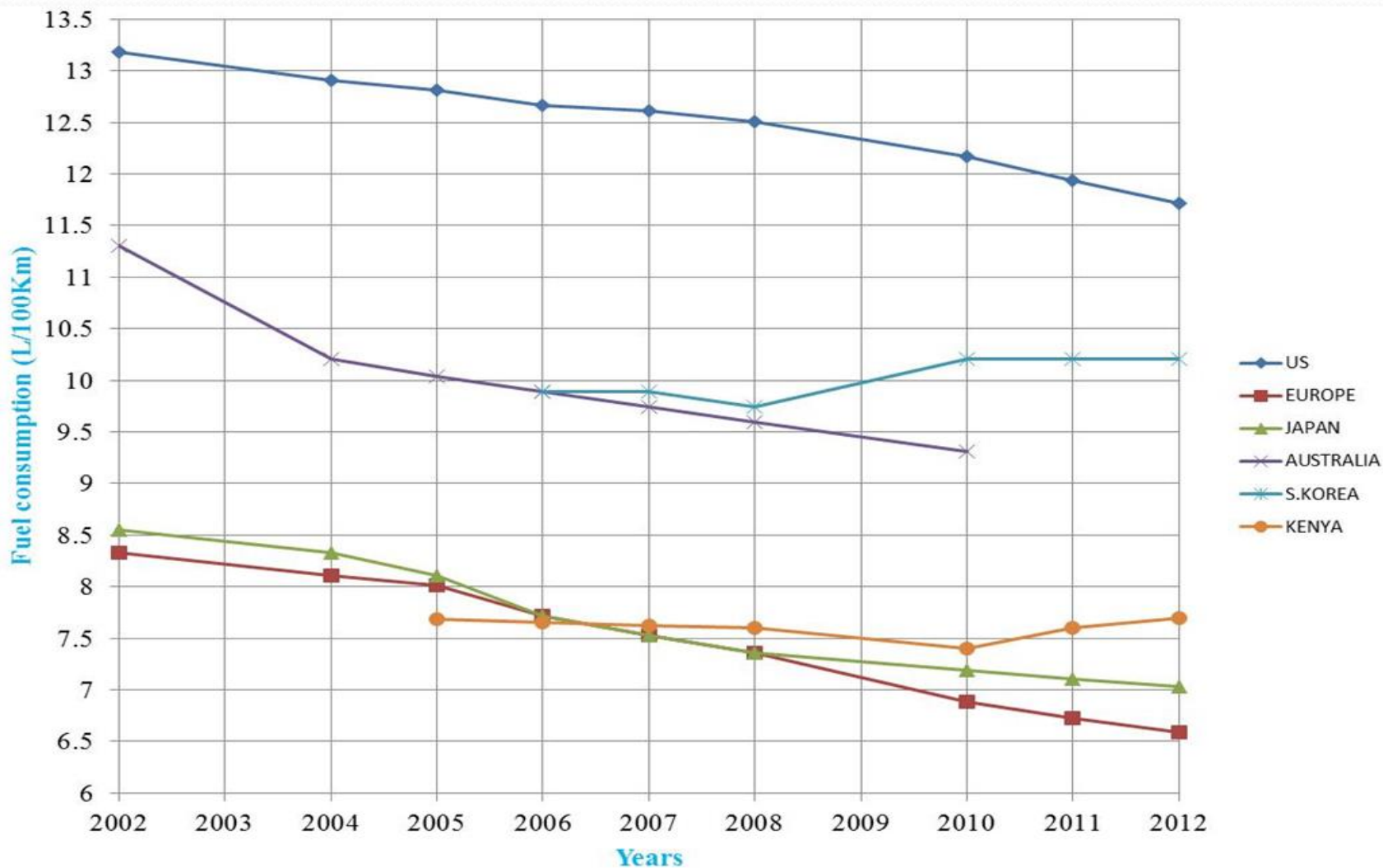
Registration of Motorcycles 2008-2014

Health Related Impact

UNES
University of Nairobi Enterprises and Services Ltd

Prevalence and cost of treatment of pollution related illnesses

- Prevalence of respiratory diseases related to air pollutants was > 90% in 2010, 2011 and 2012

- Treating a client per year costs from Kshs. 600 to Kshs. 16,800 depending on the severity of exposure (KNH Urban estimate).

Estimated costs of vehicle emission pollutants related illnesses seen at KNH

S/No.	ITEM	Average approx cost/year (Kshs)	Average approx cost/year (USD)
1	Outpatient charges including drugs/patient	600	6
2	Laboratory costs; Baseline investigations/ patient	1,700	17
	Logistical costs (e.g. bus fare/taxi etc.)	500	5
3	X -ray	700	7
	Ultra Sound screening	1800	18
	CT scan	7000	70
4	Hospital fee(Bed charges (…800…../day) for 5 days(hospitalization in severe cases)plus drugs and procedures	4,000	40
5	Follow up visits after admission/patient	500	5
	Total	**16,800**	**168**

FUEL ECONOMY LABELING AND FEEBATE PROGRAMME

FUEL ECONOMY LABELING AND FEEBATE PROGRAMME

- In February 2015 the Energy Regulatory Commission contracted UNES Ltd to carry out a feebate and vehicle labeling study as a follow-up to the recommendations proposed in the GFEI study.

T.O.R. OF THE LABELING AND FEEBATE PROGRAMME

- Conduct comparative analysis of various programs in the world.

- Identify success factors for vehicle labeling and feebate programs through review of programmes implemented world-wide.

- Undertake feasibility assessment based on interaction and study of stakeholders.

- Conduct surveys and analysis of consumer behavior focusing on car dealers.

Cont….

- Design of a vehicle labeling system of both new and used imported vehicles.

- Economic /Financial models analysis to guide selection of candidate proposals.

- Review various models of new vehicle purchase schemes, e.g., Trade-ins/scrappage/Buy backs, credit schemes etc., for both public and private sectors.

- Recommend type and age of vehicle for scrappage.

- Establish terms and conditions for scrappage programmes.

- Design of suitable new vehicle purchase schemes.

VEHICLE LABELING PROGRAMME

- Provision of information on vehicle fuel economy using vehicle labels is important for consumers to understand the choices available to them.

- Vehicle fuel economy labels fall into one of three types, depending on how the information is provided:

  - Graphical rating
  - Direct information disclosure
 - Relative vehicle performance

INTERNATIONAL BEST PRACTICE ON FUEL ECONOMY LABELING

- Mandatory labeling for all LDV
- Presentation of fuel consumption data and CO_2 emission
- Presentation of cost estimate for the next few years on the label
- Link label to fiscal policies
- Point out Influence of driving style and vehicle use
- Use branding strategies and supplement label with online-tools

VEHICLE LABELING FOR SELECTED COUNTRIES

Countries	Test Cycle	CO_2 emission Displayed?	Fuel Consumption /Economy Unit	Comparison	Mandatory (Yes/No)	Year of Introduction
United States	5 Cycle	Yes	mpg	Relative: Fuel economy Absolute: GHG and smog	Yes	1975
China	NEDC	No	l/100km	---	Yes	2010
South Korea	FTP-75 (up till 2011) US comb. (2012~)	Yes	km/l	Relative: Fuel economy	Yes	2006
India	NEDC	No	km/l	BEE: Relative and absolute SIAM: Relative	No	2012
Singapore	UN ECE R 101 (NEDC)	No (old)	l/100km	Relative: CO_2 emission Absolute: Fuel consumption	Yes	2013
		Yes (new)			Yes	
Brazil	FTP-75	No	km/l	Relative: Energy consumption by car class	No	2009
Chile	FTP-75	Yes	km/l	Absolute	Yes	2011
Australia	ADR 81/02 (NEDC)	Yes	l/100km	Absolute	Yes	2000
New Zealand	NEDC (new cars)	No	l/100km	Absolute	Yes	2011
	Japanese 10-15 (used cars)					
EU	NEDC	Yes	l/100km	Absolute	Yes	2011
South Africa	SANS 20101: 2006	Yes	l/100km	---	Yes	2008

UNES
University of Nairobi Enterprises and Services Ltd

PROPOSED VEHICLE LABELS FOR KENYA
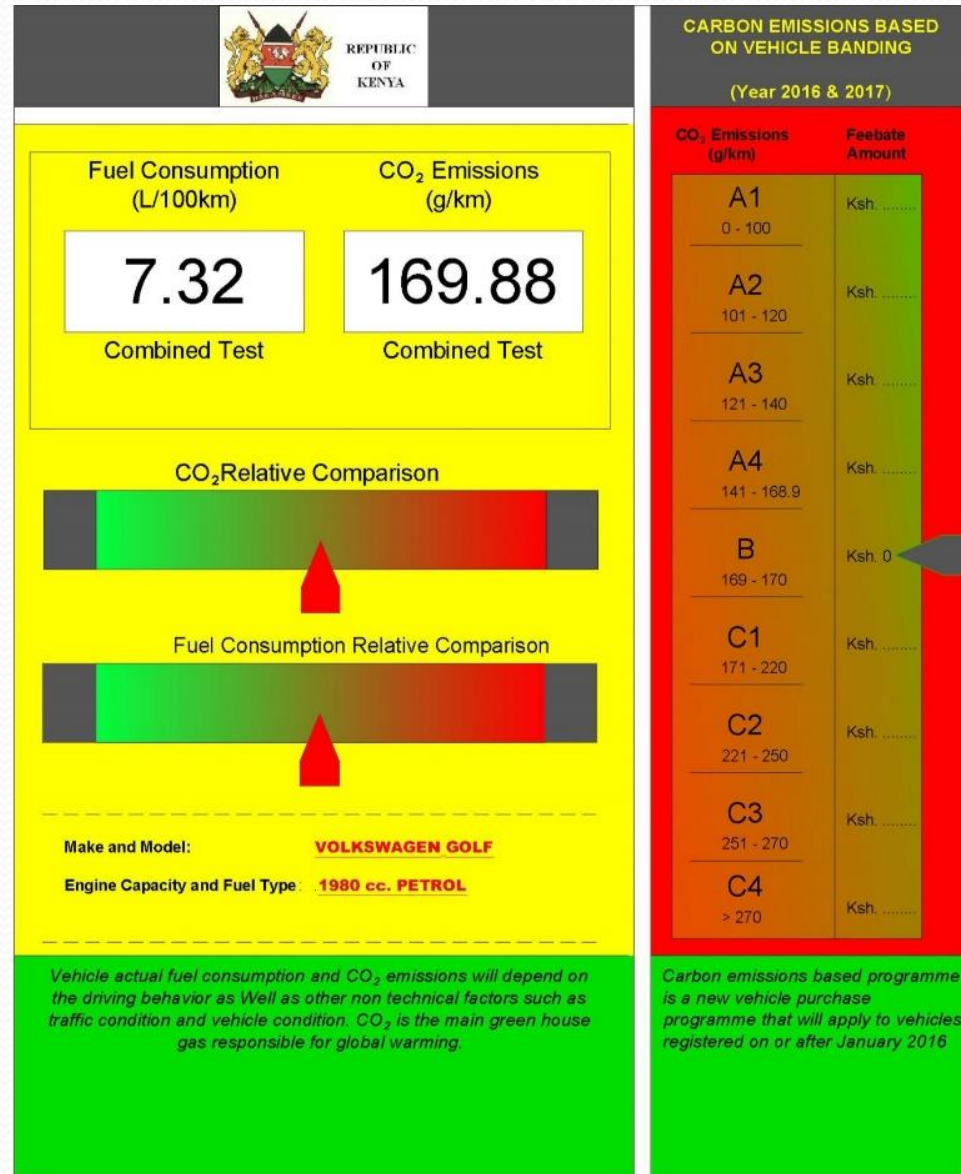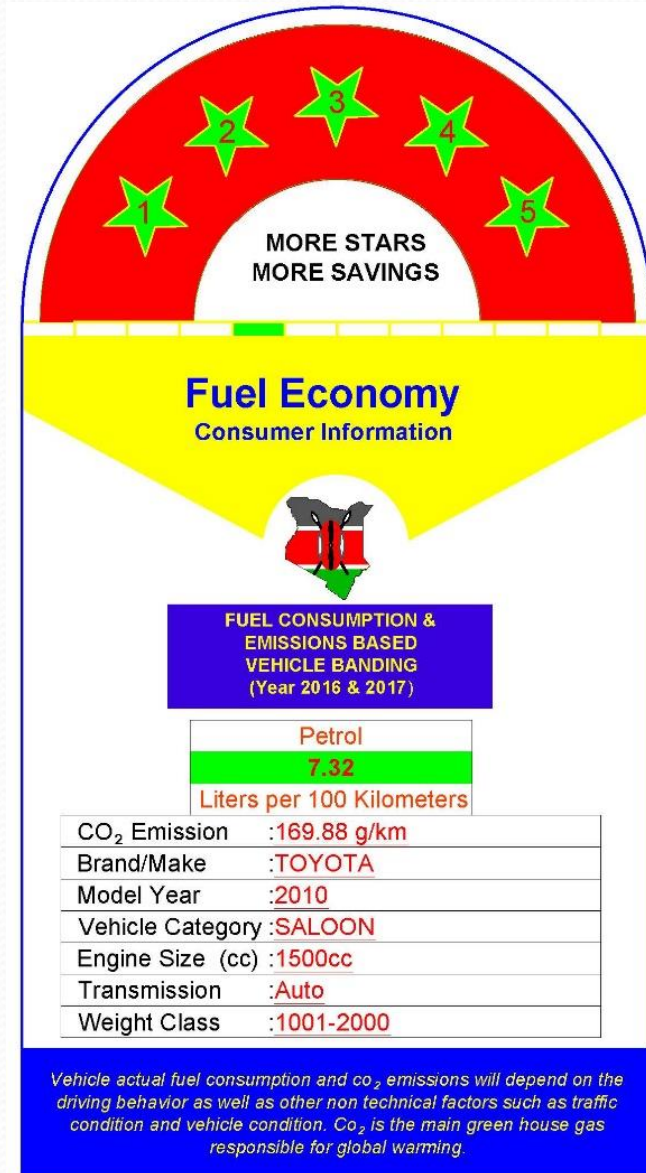

Proposed Label - 1

Cont…..
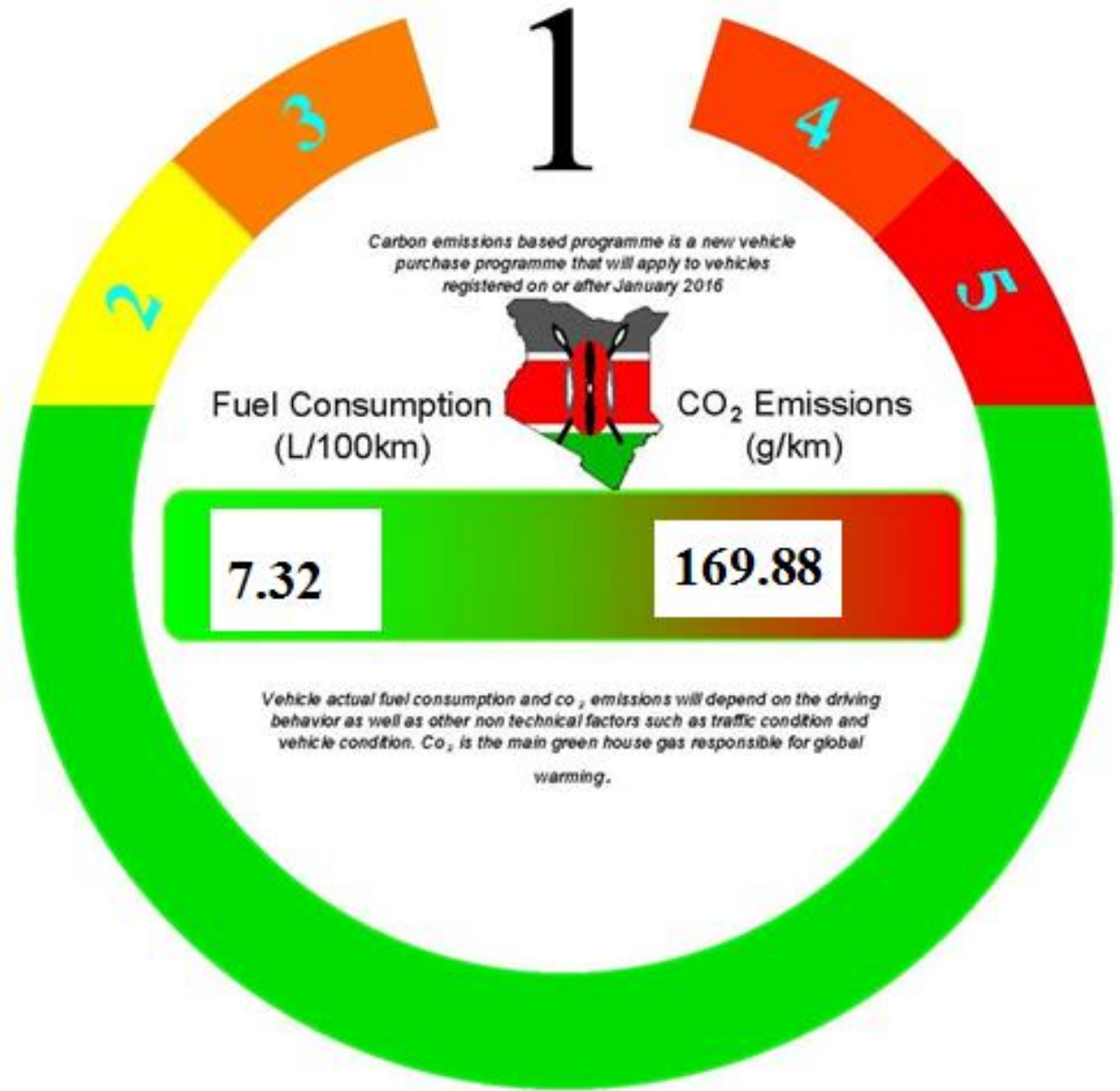
Proposed Label - 2

Cont......

**Proposed
Label - 3**

KEY STAKEHOLDERS AND PROPOSED ROLES

Kenya Bureau of Standards

- Ensure that data on fuel consumption and vehicle emission is captured at the point of inspection.

- Create an online database where vehicle buyers and auto dealers can access information on vehicle fuel consumption and CO2 emissions.

National Transport and Safety Authority

- Custodian of all relevant information on all vehicles imported into the country such as Year of Manufacture, Fuel Consumption (l/100km), CO2 Emission (g/km), Engine Capacity (cc), Make, Vehicle Model, Tare weight

Kenya Revenue Authority

- Administration of fees and rebates.

Cont…..

Auto Dealers

- Ensure that all vehicles on sale have fuel economy labels as a regulation from the Ministry and NTSA.

Energy Regulatory Commission

- Development of policy document on vehicle fuel economy and emissions.

- Conduct public awareness campaigns to promote the use of fuel economy vehicles, educate the public and auto dealers on the need for vehicle labeling program.

Cont.....

Ministry of Transport and Infrastructure

- Development of a vehicle fuel economy policy, creation of regulations for implementation of feebate and vehicle fuel labeling. Legalize implementation of the programs.

- Ensure strict compliance to vehicle fuel labeling.

- Train auto dealers on the importance of vehicle fuel label and on how they can access information on vehicle fuel economy and on the standards.

.

FORESEEN CHALLENGES

- Challenges in Data Management
- Misrepresentation of Vehicle Information
- Non Compliance
- Ignorance
- Slow Implementation of Proposed Program

NEW VEHICLE PURCHASE SCHEME

- New and more efficient vehicles protect the environment, stimulate the automotive industry and reduce vehicle abandonment.

Typical vehicle purchase schemes:

- **Trade–in's** - It offers convenience to the car buyer as they do not have to advertise, locate a buyer, arrange test drives and wait for financing

Cont….

- **Scrappage schemes** - The premise of the car scrappage scheme is that car owners could trade their existing vehicle and be awarded a bonus on their purchase of a new vehicle.

    Goals of vehicle scrappage:
    - As stimulator of vehicle industry
    - As a tool to preserve employment and promoting socio economic development.
    - As a promoter of green economy

UNES
University of Nairobi Enterprises and Services Ltd

Cont…

- **Credit schemes** - Governments create schemes to sustain the industry, for example in Nigeria, the National Automotive Council floated a fund to support the purchase of vehicles made in the country. Repayment was by installment through a credit purchase scheme over a period of three to four years at low interest rates.

- **Models of New Vehicle Purchase Schemes** -
  - Personal loans from banks are considered as one of the cheapest way to finance a car depending on the interest rate.
  - Logbook loans where a lender will temporarily own your vehicle until loan is settled.
  - Dealer finance/Hire purchase which are arranged by the car dealer and secured against the car. Most car manufacturers have their own schemes. The arrangements are also a big source of profit for car dealers

FEEBATE PROGRAMME

- A feebate is a market based policy for encouraging reduction of greenhouse gas emissions from the passenger vehicles by levying fees on relatively high emitting vehicles and providing rebates on lower emitting vehicles.

- Provision of information on fuel consumption using labels on the vehicle is important in enlightening customers on fuel economy to encourage choices based on financial running costs.

Feebate Programs Implemented Worldwide

| Country	Benchmark	Functional Form	Feebate Rate	Year of Introduction
France	Single benchmark system: 2009 Benchmark with a donut hole from 130-160 g/km (193 – 257 g/mi) and 2012 Benchmark with a donut hole from 130-140 g/km (193 – 225 g/mi)	Step function with 9 levels	Approximate rate of £18.1 per g/km	December 5, 2007, starting with rebate only. Fee part added in January 1, 2008.
Denmark	Single benchmark of 150 g/km (241 g/mi).	Two straight line function with different rates for fees ($13/g/mi) and rebates ($50/g/mi)	Based on km/l and is equivalent to $320 US per MPG (Miles per Gallon).	June 2007 as a modified registration tax
Netherlands	Footprint/class of vehicle	Step function with 7 steps	-	July 2006 and revised in February 2008
Norway	Single benchmark = 120 g/km (193 g/mi)	Four line segments with different rates	Rebate =$52/g/mi Initial fee rate = $55/g/mi Fee increases to a maximum rate of $259/g/mi	-Began taxing CO2 in January 2007, with a rate change in January 2008 - Rebate added in January 2009
Chile	Proposed Benchmark = 175 grams of CO2 per kilometer	Based largely on the French system but with a constant CO2 price rather than a step function	-	-July 2011. Its adoption is still under review, as of June 2013 -Based on the feebate proposal, a Chilean Auto Fuel Economy Label was developed for the national market and adopted in April 2013
Mauritius	Proposed Benchmark = 158gCO₂/km.	-	-	-

INTERNATIONAL BEST PRACTICES FOR FEEBATE PROGRAMME

- Linear and continuous feebate functional forms which creates a consistent incentive to improve on all vehicles' efficiencies and long-term value for CO_2 emission reductions.

- Revenue neutrality: The basic function of feebate program is to influence consumers choices for use of clean and efficient vehicle technologies. By design it is expected to cover its own administrative costs from revenue flow associated with it.

- Simplest possible feebates policy is to use a single benchmark for all vehicles, combined with a single rate parameter.

- A linear metric, such as CO_2 emissions or fuel consumption (liters/km).

- Collection of fees and granting of rebates: Consumer based programs have more impact on consumer purchase choice but have large administrative costs.

- There should be a range of vehicles that is unaffected by the feebate policy.

AWARENESS OF FEEBATE PROGRAM IN KENYA
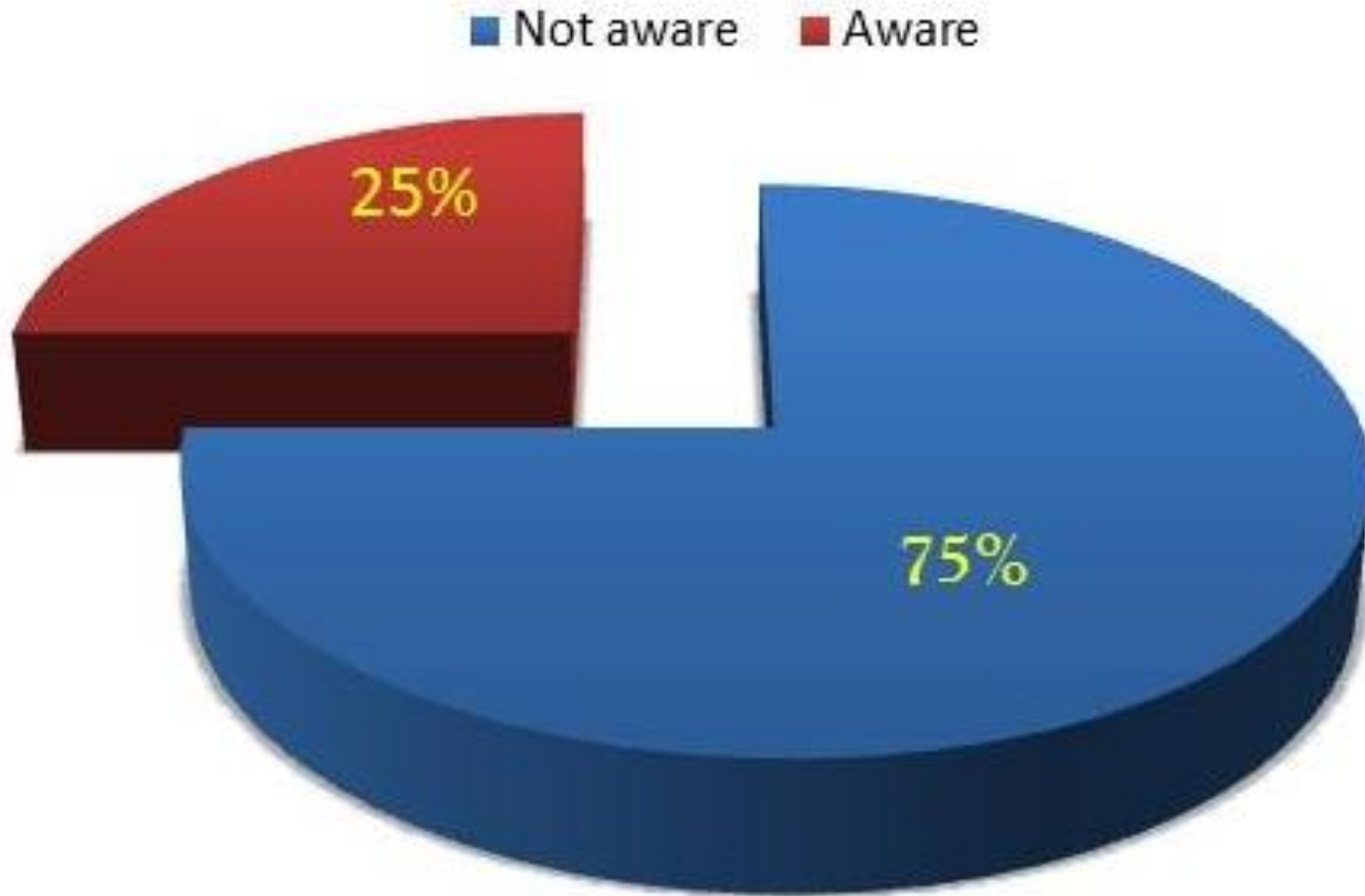
RESPONDENTS WILLINGNESS TO PAY EMISSION FEES
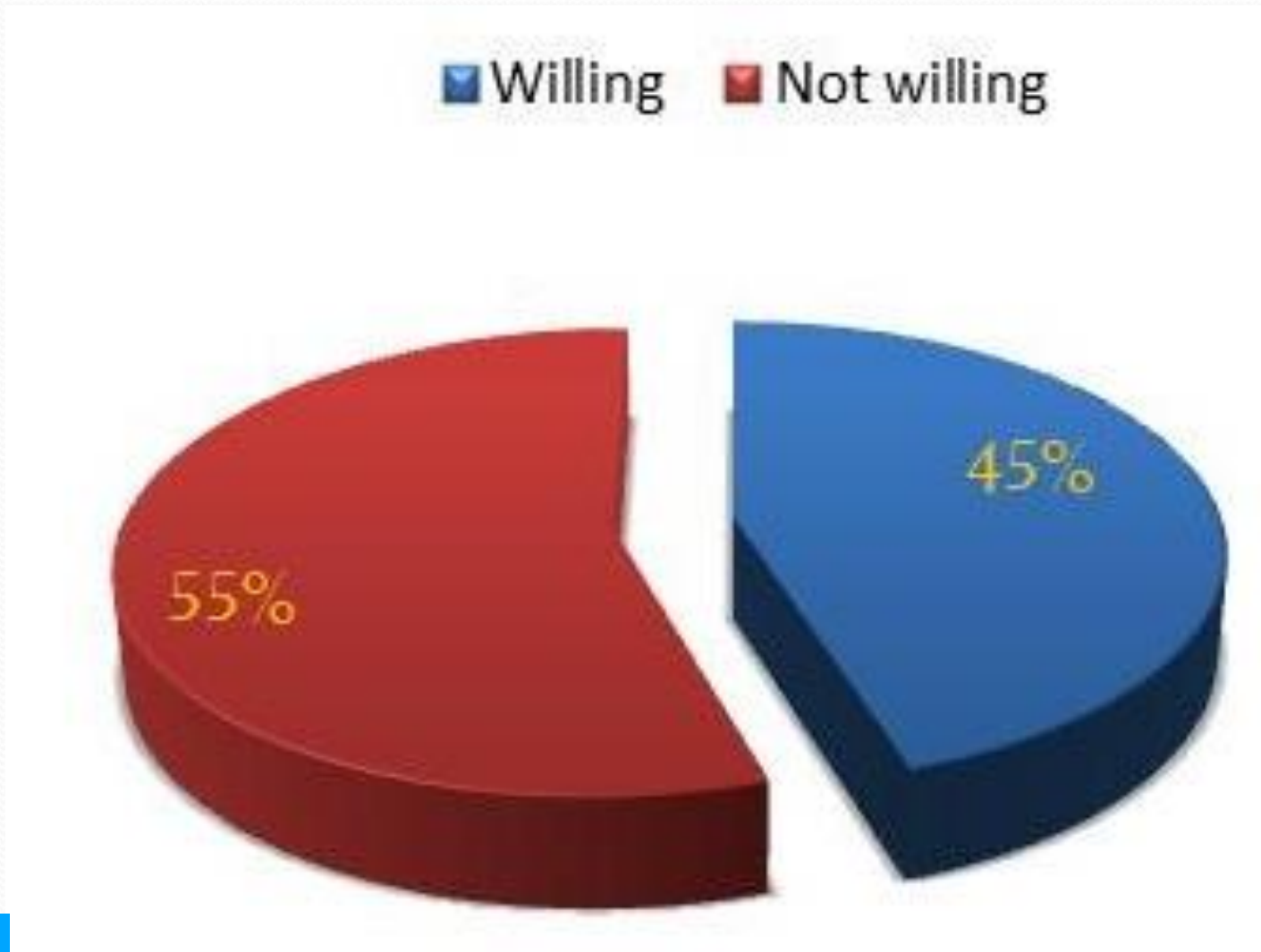
RESPONDENTS REACTION TO FEEBATE PROGRAMME

- Most respondents were receptive willing to support the programme since it would contribute to reduction in the rate of climate change and global warming.

- Additionally, the respondents indicated willingness to pay emission related fees in the range of Kshs 1000/= to 50,000/= but that rebates should be in the range Kshs 10,000/= to 100.000/=.

- Car sales(dealers) however foresee a reduction in profits if the public shifts to more fuel efficient vehicles, presumably with low engine capacities and also costing less.

ESTABLISHING THE BENCHMARK RATE

Step 1

- Establish the gCO_2 emitted for each vehicle model and the number of units.
  - Such that; g = units per model x gCO_2

Step 2

- Determine the weighted average CO_2 which is the average for all the vehicle models in the inventory.
  - WAvgCO2 = Total emission/number of units

Step 3

- Determine the difference between the weighted average CO2 and the individual emission per vehicle;
 - D =WAvgCO2 – gCO2

Cont....

Step 4

- The key assumption is that at the point of purchase, the consumer chooses between fuel efficient and fuel inefficient vehicles whereas the government selects tax and rebate policies with the objective of maximizing welfare.

Step 5

- Using simulations in R Statistical software and excel; the following fee proposals; Ksh 800, 1200, 1500, 2500 and 5000 based on proposals obtained from the consumer interviews were obtained.

Depiction of the Proposed Feebate System for Kenya
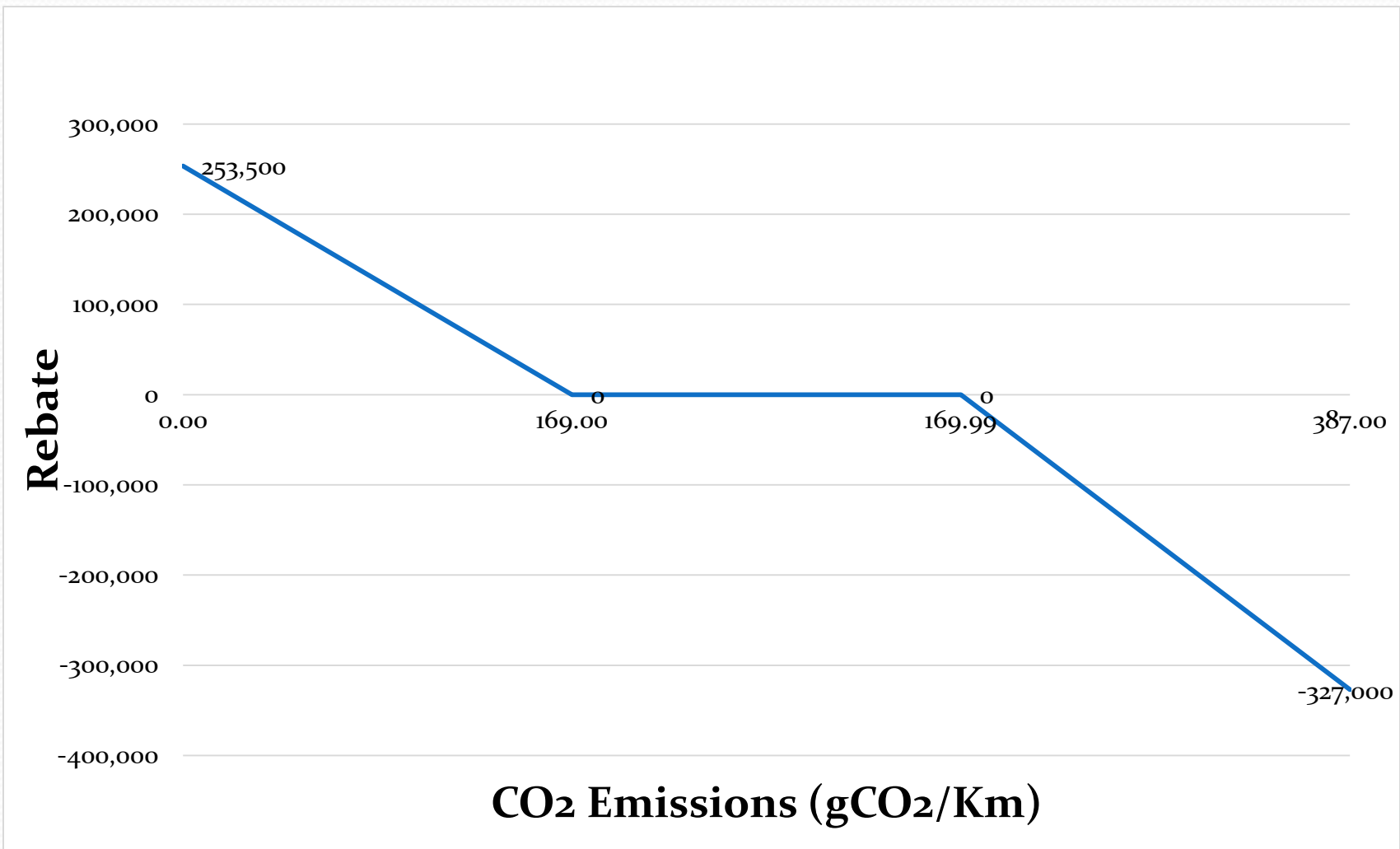
Fees and rebates (2010-2014)

Item	Five year	Annual Average
Fee	7,840,850,610.00	1,568,170,122.00
Rebate	-7,401,047,209.29	-1,480,209,441.86
Difference	439,803,400.71	87,960,680.14

- The recommended rate of Kshs 1,500 gCO2/km applies to both fees and rebates.

CONCLUSIONS

Vehicle Labeling Program

- The proposed vehicle fuel labels indicate both the fuel consumption and CO_2 emission of the vehicle.

- With expected implementation of a feebate program the proposed labels (option 1) provides information on rebates or fees to be awarded or charged on a vehicle on sale.

- Information to be placed on proposed label will be a guide to prospective vehicle buyers.

- The proposed vehicle labels have information indicating that fuel economy and emissions may be different due to a number of factors, such as how you drive and maintain your vehicle, how much the vehicle is loaded and other factors.

UNES
University of Nairobi Enterprises
and Services Ltd

CONCLUSIONS

Feebate Program

- Increase in duties and fees is likely to have some marginal effects on vehicle purchase and thus influence choice based on engine size.

- Average CO_2 emission using the 2010 – 2014 dataset was 169.88 gCO_2/km and the average fuel consumption is 7.17 L/100km.

- Implementation of feebate programme is likely to have an impact in influencing purchase of fuel efficient and less carbon emitting vehicles.

- Proposed benchmark of between 169.00 gCO_2/km to 169.99 gCO_2/km and a rate of Kshs 1,500 for both rebate and feebate would not significantly differ from countries that have feebate programs initiated.

- Regular reviewing of the 170 gCO_2/km should be embraced.

RECOMMENDATIONS

Labeling Program

- To ensure that the proposed vehicle labeling is implemented, Kenya Bureau of Standards (KEBs) in consultation with Energy Regulatory Commission (ERC) and other stakeholders should develop a standard on vehicle labeling. ERC should hold consultative forums with key stakeholders to reach an agreement on proposed vehicle labels.

- Development of a web site that would be launched in conjunction with the new label. This consumer-focused web site should provide more detailed information, with access to tools, applications and social media. The online database should be created by KEBS where vehicle buyers and Auto dealers can log in to access vehicle information.

- ERC to lobby support for enactment of a revised Energy Bill (could be of 2015). The bill should propose establishment of an energy efficiency and conservation agency, in relation to vehicle fuel efficiency. The proposed agency will be instrumental in implementing vehicle labeling program.

Cont....

Feebate Study

- The study recommends that should a fee-bate system be initiated in Kenya, a range between 169.00 gCO_2/km to 169.99 gCO_2/km be used as a benchmark level where there will be no fee or rebate for vehicles with emissions falling within the range.

- Vehicle purchases with emissions below 169.00 gCO_2/km be considered efficient and an incentive of Kshs 1,500 per gCO_2/km be established as the rebate.

- A fee of Kshs 1,500 per gCO_2/km for vehicles with emissions above 170 gCO_2/km be charged.

- The rebate fee should be lower than the fee upon determining the administrative costs involved with a view of ensuring that there are revenues generated from the program.

END

Thank you for listening

UNES
University of Nairobi Entreprises
and Services Ltd