Promoting Safer and Cleaner Used Vehicles for Africa

2020

A research project of the
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Promoting Safer and Cleaner Used Vehicles for Africa

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Executive Summary

The Promoting Safer and Cleaner Used Vehicles project aims to contribute to sustainable economic growth through the development of a set of standard requirements for the importation of used vehicles into African countries. The aim of this research paper is to investigate the feasibility, social/financial/environmental impact, and challenges to policy reform so that sound recommendations for this policy reform can be explored.

In an attempt to attract more foreign investment, Africa has entered into open trade agreements with many wealthier regions. This has led to the use of Africa as a method of disposal for expired, contaminated, and hazardous products. Africa has in essence become a 'dumping ground' for sub-standard and expired products which are often cheaper to export than to dispose of. This report focusses on used vehicles (Bahadur, 2018). Many African countries import used and potentially unsafe vehicles from high income countries. The main exporters of used vehicles are the United States of America, Japan, and the European Union (with Germany being the largest exporter within the EU).

Currently, five African countries have a complete ban on the importation of used vehicles, four of which are located in North Africa. Twenty-two countries have no restrictions on the importation of used vehicles. The remaining twenty-seven countries have age restrictions on the importation of used vehicles, ranging from three years to 15 years. Fifteen countries, with and without age restrictions, impose additional taxes on vehicles imported older than a certain age, ranging from three years to ten years. Mauritius, Seychelles, and Uganda implement additional tax based on the environmental impact. Policies on the exportation of used vehicles vary between exporting countries, ranging from only ownership documentation, to a full range of inspections. Several impacts need to be considered before policy change in implemented.

THE ENVIRONMENTAL IMPACT

The cost of pollution as a result of vehicle emissions needs to be considered. Vehicle emissions contribute substantially to climate change, which in itself may negatively impact the future socio/economic and environmental growth of a country. Climate change contributes to unpredictable weather occurrences and natural disasters. Natural disasters, such as floods, droughts, extreme heat, etc., have an impact on national and individual economies. Many African countries are at greater risk as they do not have the infrastructure nor the resources required to effectively deal with natural disasters. Natural disasters additionally lead to food scarcity and hunger (World Meteorological Organisation, 2019).

A relationship exists between air pollution and a range of health-related problems, such as lung diseases, strokes, cancer, diabetes, etc. The burning of diesel is one of the biggest contributors to air pollution. Sub-Saharan Africa experienced a 75% increase in transport emissions between 2000 and 2016, with transport emissions increasing 153% in Ghana, 73% in Kenya, and 16% in Nigeria (Baskin, n.d.). Similarly to the safety features, newer vehicles are designed to be more fuel-efficient, and to emit fewer greenhouse gasses than older vehicles.

THE ECONOMIC IMPACT

The importation of safer vehicles will most likely reduce the number of road deaths in African countries annually, reducing the cost associated with the loss of life and road injuries. Similarly, the medical costs of treating illnesses related to air pollution, will be beneficial to government funds. By reducing the impact of pollution on climate change, natural disasters are decreased, requiring less spending on the recovery of countries after natural disasters, as well as reducing food insecurity. On an individual level, more fuel-efficient

vehicles reduce the amount spent on fuel, assuming that individuals do not drive more. Additionally, the initial cost of maintenance will be reduced as newer vehicles require less maintenance than older vehicles.

However, the change in policy will require additional funding to implement regulatory bodies to enforce and control the implementation of the policy. A substantial decrease in the amount of fuel sold may result in the loss of jobs in the petroleum industry, adding to the already severe poverty crises in most African countries. The initial reduction in the required maintenance may impact the livelihood of auto-mechanics, by reducing the number of major services they perform. The cost of quality checks, and the reduced age of used vehicles, will most likely increase the cost of a used vehicle to the first African buyer. This increased cost does not extend to subsequent buyers of the vehicle as the first African buyer can only sell the vehicle for a market-related price.

THE SOCIAL IMPACT

The combined environmental and economic impacts influence the social impact of policy change regarding the importation of used vehicles to Africa. Safer vehicles will reduce the number of road-related deaths and injuries, reducing the fiscal burden associated with loss of life and recovery from serious injury, improving the quality of life of societies. Similarly, more environmentally friendly vehicles will reduce ambient (air) pollution, reducing the impact of ambient pollution on climate change, reducing the number and severity of natural disasters, reducing the cost associated with the recovery following natural disasters, and improving the quality of life of societies. A reduced cost in terms of fuel and initial maintenance will improve the quality of life of individual drivers.

Conversely, the increased cost of importation will most likely fall on the first African buyer of a used vehicle, which may decrease their individual quality of life. The increased price of used vehicles may influence the availability of public transport, reducing the number of vehicles used for public transport and/or increasing the price of public transport, decreasing the quality of life of individuals that depend on public transport. Auto-mechanics may experience a decrease in their quality of life as newer used vehicles require less maintenance, reducing their business. This impact is however only temporary as used vehicles are likely to continue to age in African countries until they reach an end of life stage.

CHALLENGES TO POLICY CHANGE

Currently, 45 of the 54 African countries import fuel from South Africa. The fuel quality requirements in South Africa are set at Euro 2/II standards. Unless fuel quality standards are changed, any policy requirements above Euro 2/II will be moot. Likewise, in some African countries fuel taxes are used as a form of government revenue, thus, a substantial decrease in the amount of fuel sold, will impact government revenue.

THE SOCIAL IMPACT (CONTINUED)

Exporting countries of used vehicles will be limited in the vehicles that are permitted to be imported to African countries. Additionally, exporting countries will be impacted by the increased demand for end of life vehicle disposal, requiring additional facilities, as well as increasing pollution.

Finally, African countries are known for the lack of effective law enforcement. The implementation of policy changes require the effective control of used vehicles. Smuggling of used vehicles has also been identified as a challenge to policy change. In order to enforce policy change, the smuggling of used vehicles has to be eradicated.

POLICY SUGGESTION

The Automobile Association of South Africa, supports the following policy, as tentatively suggested by the United Nations. Summarised, these requirements are:

- The development of an endorsed used vehicle quality label, displayed on all used vehicles exported and imported;
- A minimum of Euro 4/IV or equivalent emission standards;
- A maximum vehicle age of five-years-old;
- The banning of export or import of zero-rated, as well as one star-rated, NCAP vehicles;
- Key safety features are in place and in working order;
- Key environmental features are in place and in working order;
- Repaired vehicles with an accident history of compromised structural integrity banned from export;
- Incentivise the import of low to zero carbon and electric used vehicles;
- Provide maintenance support for cleaner vehicle technology;
- Provide aftermarket support.

The effective implementation of these policy suggestions depends on the response to the challenges to policy change. Specifically, the improvement of fuel quality is fundamental to the implementation of the policy changes. Furthermore, the most appropriate implementation of policy change will be to phase policy change into African countries. The extent to which policy in diverse African countries differ from the suggested policy, ranges from close likeness to a complete lack of policy.

List of abbreviations

AASA	Automobile Association of South Africa
CFI	Clean Fuels I
CFII	Clean Fuels II
CO	Carbon Monoxide
CO2	Carbon Dioxide
FiA	Fédération Internationale de l'Automobile
FiA ACTA	FiA African Council for Touring and Automobiles
GDP	Gross Domestic Product
GFEI	Global Fuel Economy Initiative
GNI	Gross National Income
HC	Hydrocarbons
IMF	International Monetary Fund
JAAI	Japan Auto Appraisal Institute
JEC	Japanese Export Certificate
JEVIC	Japanese Export Vehicle Inspection Center
JOCI	Japan Odometer Certification Institute
MVRF	Motor Vehicle Recycling Facilities
NCAP	New Car Assessment Programme
NOx	Nitrogen Oxides
PM	Particulate Matter
PN	Particulate Number
PVoC	Pre-shipment Verification of Conformity
PWC	Price Waterhouse Coopers
QISJ	Quality Inspection Services
SACU	South African Customs Union
UN	United Nations
UNEP	United Nations Environment Programme
VOC	Volatile Organic Compounds
WHO	World Health Organisation
WMO	World Meteorological Organisation

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Introduction

Introduction

Africa remains the least motorised continent in the world. Motorisation levels in Africa are, however, growing at a rapid rate and are predicted to increase by up to five times by 2050. As a result of their global economic standings, it makes sense that most African countries have become the destination for used vehicles, imported primarily from the United States, Japan and the European Union (Automobile Association of South Africa, 2017).

Used vehicles are generally sold from high-income countries to low-income countries. High-income countries tend to generate or produce more vehicles, while low-income countries have an elevated demand for used vehicles (Coffin, Horowitz, Nesmith & Semanik, 2016).

The sellers of used vehicles are benefited by selling their vehicles at a higher price than they would have received in their own country. In addition to the higher value of used vehicles, these vehicles are also removed from saturated markets. The buyers of used vehicles benefit by having the capability to buy better quality vehicles for lower prices and in larger varieties. This is most likely due to the rapid rate of depreciation in high-income countries, as a result of the increased maintenance and repair costs, compared to low-income countries (Coffin, Horowitz, Nesmith & Semanik, 2016).

Three main reasons for the import of used vehicles into African countries are provided in a report by Coffin, Horowitz, Nesmith and Semanik (2016). Firstly, only a limited number of new vehicles are produced or imported, making it easier to find a used vehicle. In 2016 Ethiopia produced 8 000 new vehicles while importing 110 000 used vehicles (Igunza, 2017). Next, used vehicles tend to be more affordable than new vehicles. For example, the average cost of a new vehicle exported from the USA in 2014 was $28 000, while the average cost of exporting a used vehicle was $11 000. This is a particularly important aspect as individuals in low-income countries are often financially constrained. Lastly, due to the decreased cost of labour in low-income countries, the maintenance and repair costs of vehicles are more affordable (Coffin, Horowitz, Nesmith and Semanik, 2016). These benefits do not necessarily outweigh the indirect costs associated with the used vehicle market in Africa, such as the cost of road traffic crashes as a result of unsafe vehicles.

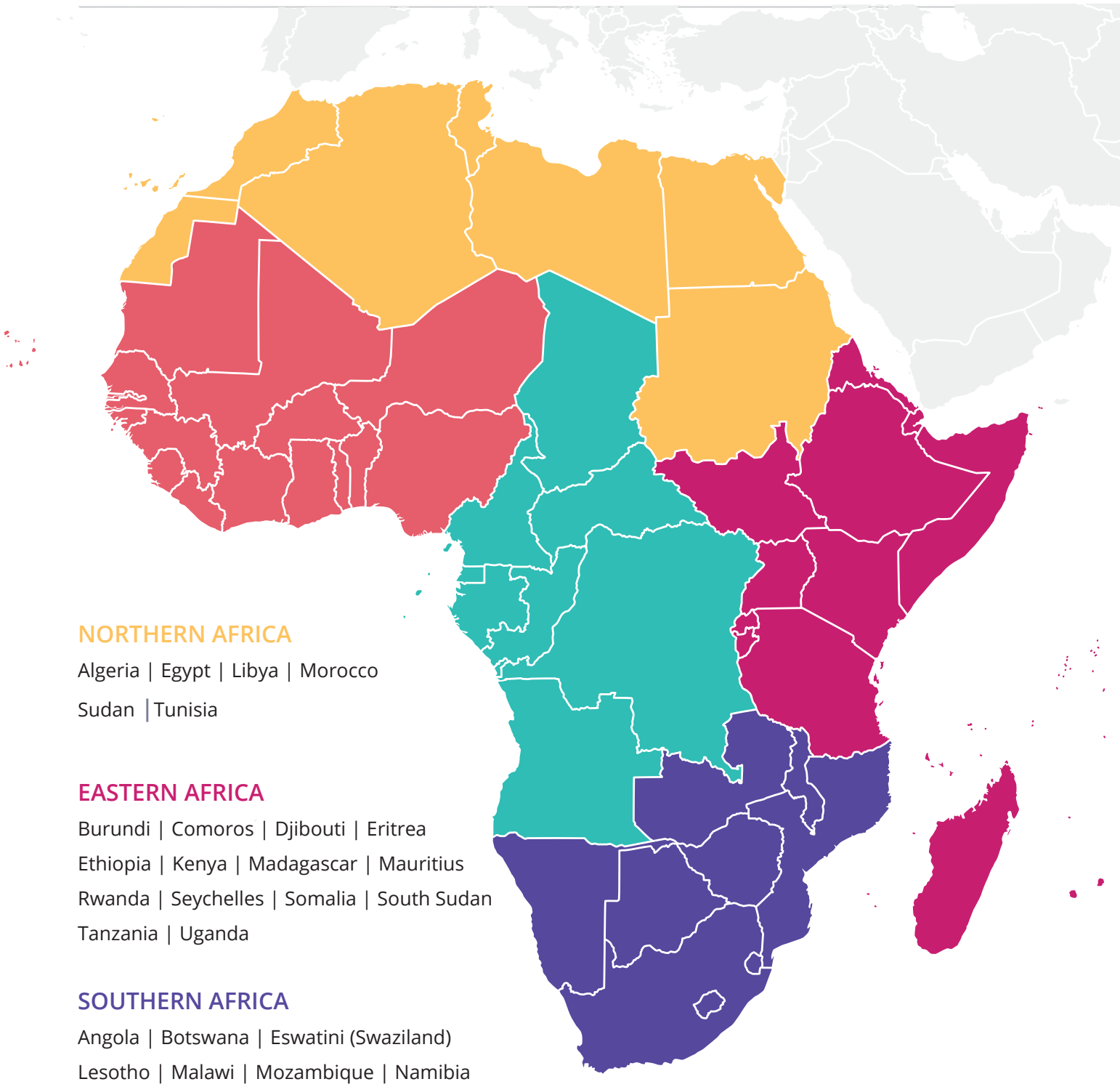
This report begins by considering the current state of road safety in African countries, and considering the safe systems approach in response to this. The report also explores the current legislation in African countries. There is a very small discrepancy between the current policies and the suggested policy in Northern Africa. This discrepancy is much larger in East, West, Central and Southern Africa. Yet, policy changes cannot be implemented without the consideration of the impact that these changes will have. The environmental, economic, and social impact of policy change is considered from both a negative and a positive point of view.

The challenges to policy reform, namely law enforcement, smuggling, fuel specifications, the impact to government tax, and the impact to government tax, are discussed, after which recommendations for the implementation of new policy is suggested.

For the purposes of this report, the African countries have been divided into continental blocs, as follows:

Table 1:

Continental blocs



NORTHERN AFRICA

Algeria | Egypt | Libya | Morocco
Sudan | Tunisia

EASTERN AFRICA

Burundi | Comoros | Djibouti | Eritrea
Ethiopia | Kenya | Madagascar | Mauritius
Rwanda | Seychelles | Somalia | South Sudan
Tanzania | Uganda

SOUTHERN AFRICA

Angola | Botswana | Eswatini (Swaziland)
Lesotho | Malawi | Mozambique | Namibia
South Africa | Zambia | Zimbabwe

WESTERN AFRICA

Benin | Burkina Faso | Cape Verde | Gambia
Ghana | Guinea | Guinea Bissau | Ivory Coast
Liberia | Mali | Mauritania | Niger | Nigeria
Senegal | Sierra Leone | Togo

CENTRAL AFRICA

Cameroon | Central African Republic | Chad
Democratic Republic of the Congo |
Equatorial Guinea | Gabon | Republic of the
Congo | Sao Tome and Principe

CURRENT STATE OF ROAD SAFETY IN AFRICA

Globally, road traffic crashes claim approximately 1,25 million lives annually, costing governments up to 3% of GDP. The global road-related death rate is 17,4 per 100 000 population. Africa has the highest fatality rate, estimated at 26,6 per 100 000 population, although Africa has the lowest rate of motorisation globally. Africa contributes 20% to the overall road death rate, yet has only 2,3% of the world's vehicles (WHO, 2018). "Every day, about 650 deaths occur on Africa's roads" (WHO, 2018, p4). In addition to the costs related to the death of individuals, further costs are incurred for non-fatal injuries and material damages.

In 2015, all of the United Nations member states adopted the 2030 Agenda for Sustainable Development, which includes road safety targets for the first time. The 2030 Agenda for Sustainable Development consists of 17 goals and their 169 targets; two of these goals refer specifically to targets related to road safety. Goal 3, to ensure healthy lives and promote well-being for all at all ages, and Goal 11, to make cities and human settlements inclusive, safe, resilient and sustainable have targets set to improve road safety:

Target 3.6:

By 2020, halve the number of global deaths and injuries from road traffic accidents.

Target 11.2:

By 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons (WHO, 2017).

THE SAFE SYSTEMS APPROACH

In 1970, William Haddon developed an injury prevention matrix, which encourages the consideration of all factors that contribute to road-related injury or death (Haddon, 1970). This approach, first implemented in the Netherlands and Sweden in the 1990s, is known as the safe systems approach (WHO, 2017). In order to decrease the number of road fatalities, a safe systems approach is recommended by the WHO. "The (safe) "systems" approach seeks to identify and rectify the major sources of error or design weakness that contribute to fatal and severe injury crashes, as well as to mitigate the severity and consequences of injury" (WHO, 2004). The safe systems approach is based on four principles of road safety. The first principle is human fallibility, acknowledging that humans will always make mistakes. The second principle is human vulnerability, accepting that the human body has a limited capacity to tolerate impacts, such as those experienced during vehicle crashes. The third principle emphasises that road safety is a shared responsibility of all those that design, build or use roads. The final principle refers to the building of a safe and forgiving road system. In order to build a safe and forgiving road system, safe roads, safe speeds, safe people, safe vehicles, and improved post-crash care is needed to ensure that people are protected in layers from serious injuries and fatalities related to road crashes. Figure 1 provides a comparison of traditional approaches to road safety and a safe systems approach.

Figure 1: Traditional vs Safe Systems approach to road safety (towardszerofoundation.org)

	Traditional	Safe System
What is the problem?	Accidents	Fatalities and serious injuries
What causes the problem?	Human Factors	People make mistakes, people are fragile
Who is ultimately the problem?	Individual road users	System designers
What is the major planning approach?	Incremental approachto reduce the problem	Systematicapproach to build a safe road system
What is the appropraite goal?	Optimum number of fatalities and serious injuries	Zero fatalities and serious injuries

Similarly, the UN Decade of Action for Road Safety (2011-2020) identifies five pillars, as part of the action plan to reduce global road fatalities. The pillars are road safety management, safer roads and mobility, safer vehicles, safer road users, and post-crash response. Although all of these aspects play an important role in the reduction in the number of road fatalities, this report focusses on the safer vehicles aspect specifically.

THE IMPORTANCE OF SAFER VEHICLES

Safer vehicles, or the lack thereof, are unanimously considered one of the biggest threats to road safety. In both the UN Decade of Road Safety, and in the Safe Systems Approach, safe vehicles play an integral role, indicating the need for safer vehicles to reduce road-related injuries and fatalities.

Approximately 2,5 million used vehicles were exported from the three global exporting hubs: the United States, Japan, and the EU (with Germany as the main exporter within the EU) in 2017, with about 48% of those vehicles destined for African shores. Not all used vehicles are created equally, providing some with modern, updated safety features, whilst leaving others without any.

Unsafe vehicles are likely to become a further problem to road safety when older used vehicles are sold to African countries, especially where little or no importation restrictions exist. For example, in Liberia, the allowance for the importation of used vehicles is up to twelve years of age and, as such, these vehicles are unlikely to possess the same safety features as say a newer vehicle would potentially have.

The current regulation surrounding export/import of used vehicles into Africa

The current regulation surrounding export/ import of used vehicles into Africa

IMPORTING COUNTRIES

The laws and/or regulations related to the importation of used vehicles varies from country to country, from complete bans to no restrictions. In some of the countries where no restrictions exist, an additional tax is added to importation fees based on the age of the vehicle.

Table 2: Age restrictions for imported used vehicles per country (Baskin, 2018).

	Current law (Age restrictions)	Additional age-based tax
NORTH AFRICA		
ALGERIA	Complete ban	-
EGYPT	Complete ban	-
LIBYA	5-year age limit	-
MOROCCO	Complete ban	-
SUDAN	Complete ban	-
TUNISIA	5-year age limit	5 years
EAST AFRICA		
DJIBOUTI	No restrictions	-
BURUNDI	No restrictions	-
COMOROS	No information	-

EAST AFRICA	Current law (Age restrictions)	Additional age-based tax
ERITREA	10-year age limit	-
ETHIOPIA	No restrictions	-
KENYA	8-year age limit	3 years
MADAGASCAR	No restrictions	-
MAURITIUS	3-year age limit	-
RWANDA	No restrictions	10 years
SEYCHELLES	3-year age limit	-
SOMALIA	No restrictions	-
SOUTH SUDAN	No restrictions	-
TANZANIA	No restrictions	8 years
UGANDA	No restrictions	5 years

WEST AFRICA		
BENIN	10-year age limit	-
BURKINA FASO	No restrictions	-
CAPE VERDE	No restrictions	4 years
GAMBIA	No restrictions	10 years

WEST AFRICA	Current law (Age restrictions)	Additional age-based tax
GHANA	No restrictions	5 years
GUINEA	8-year age limit	-
GUINEA BISSAU	No restrictions	-
IVORY COAST	No restrictions	10 years
LIBERIA	12-year age limit	10 years
MALI	No restrictions	10 years
MAURITANIA	8-year age limit	-
NIGER	No age limit for SACU, 5-year age limit from outside SACU	-
NIGERIA	15-year age limit	-
SENEGAL	8-year age limit	-
SIERRA LEONE	No restrictions	4 years
TOGO	No restrictions	-

CENTRAL AFRICA		
CAMEROON	7-year age limit	-
CENTRAL AFRICAN REPUBLIC	No restrictions	-
CHAD	3-year age limit	-

CENTRAL AFRICA

	Current law (Age restrictions)	Additional age-based tax
DEMOCRATIC REPUBLIC OF THE CONGO	10-year age limit	-
EQUATORIAL GUINEA	No restrictions	-
GABON	4-year age limit	-
REPUBLIC OF THE CONGO	7-year age limit	-
SAO TOME AND PRINCIPE	-	-

SOUTHERN AFRICA

ANGOLA	3-year age limit, only for personal use	-
BOTSWANA	Max 100 000km	-
ESWATINI (SWAZILAND)	15-year age limit	-
LESOTHO	8-year age limit	-
MALAWI	No restrictions	9 years
MOZAMBIQUE	5-year age limit	-
NAMIBIA	8-year age limit	-
SOUTH AFRICA	Complete ban	-
ZAMBIA	No restrictions	-
ZIMBABWE	No restrictions	5 years

IMPORTING COUNTRIES (CONTINUED)

Currently, 25 of the 54 African countries have no policy regulating the importation of used vehicles. Among the 27 that implement age restrictions on imported used vehicles, only 14 have banned the importation, or have a five year or less restriction. In addition to these age restrictions, some countries have incentivised the importation of cleaner used vehicles, such as in the Seychelles, Nigeria, and Uganda.

The Seychelles offers incentives for the importation of hybrid and electric vehicles, as a tax reduction, based on the engine capacity of the vehicle (Magnan, 2017).

Table 3: Tax reduction for hybrid and electric vehicles imported to the Seychelles

Engine capacity	% of TAX due
1600cc and below	12.5 % of excise tax
1600cc – 2000cc	37.5 % of excise tax
2000cc – 2500cc	75 % of excise tax
2500cc and above	100 % of excise tax

Nigeria taxes the importation of used diesel vehicles higher than petrol vehicles, as diesel vehicles contribute substantially more to ambient air pollution. Diesel is also priced higher in Nigeria, to discourage the use of diesel vehicles. Furthermore, all vehicles imported into Nigeria are required to meet Euro 3/III or equivalent emission standards.

According to Uganda's Traffic and Road Safety Bill of 2018, used vehicles imported are subject to an environmental levy of 35 – 50% of the customs value. A vehicle is subject to 35% of the customs value if the vehicle is between 5 and 8 years old, and subject to 50% if the vehicle is older than 8 years. Vehicles younger than 5 years do not pay the environmental levy. Therefore, the total amount of tax payable during importation is an import duty (25%), Value Added Tax (18%), Withholding tax (6%), Infrastructure levy (1,5%), and the Environmental levy (35 – 50%) (Uganda Revenue Authority).

At the moment only 45% of the FiA African Council for Touring and Automobiles (FiA ACTA) countries require pre-shipment inspections, which is likely to increase in the near future. FiA ACTA is supported by FiA Mobility Region I, and includes 12 African member clubs (AA South Africa, AA Namibia, Emergency Assist 911 Botswana, ATCM Mozambique, AA Zimbabwe, AA Kenya, AA Uganda, AA Tanzania, RAC Rwanda, Automobile and Touring Club Nigeria, and Automobile Club du Gabon). Kenya and Uganda require Japanese Export Vehicle Inspection Center (JEVIC) or Quality Inspection Services inspections to be performed before shipment of the vehicles. JEVIC's inspection involves a mechanical and structural inspection, ensuring the roadworthiness, road safety, and emission levels meet the required standards. This inspection safeguards African countries from becoming the dumping ground for end-of-life vehicles (JEVIC). Mozambique makes use of the Intertek, an international quality assurance provider, pre-shipment inspection for all vehicles that are imported. A certificate of conformity is issued as part of the Pre-Export Verification of Conformity to Standards Programme (PVoC). Intertek further works with Kenya, Tanzania, Uganda, Botswana, Mozambique, and Nigeria with the Standards & Requirements for imports. Tanzania makes use of the 80-point test, JAAI inspection before importing a vehicle from Japan. Uganda implemented legislation in May 2018, set by the Uganda National Bureau of Standards, once the vehicles have been imported to the country. Vehicles imported to Botswana undergo a vehicle evaluation obtained from an accredited used car dealer.

EXPORTING COUNTRIES

The preconditions to export a vehicle form Japan begin with the deregistration of the vehicle through the Japanese Transport Authority, whereafter the vehicle is issued with a Japanese Export Certificate (JEC). The JEC contains at most the details of the last two registration inspections, newer vehicles may only have one or no previous registration inspections. The pre-export inspection focuses on functionality, equipment, as well as the interior and exterior appearance of a vehicle.
The key inspection items must include:

- Visual/Body Inspection
- Mechanical and Environmental Inspection
- Document Verification
- Electrical System
- Safety Inspection
- Radiation check
- Stolen vehicle check

When a vehicle passes minimum safety standards, a certificate of roadworthiness is issued.

1. Functionality: To ensure safe driving in compliance with the safety regulations of the respective countries.
2. Exterior appearance:
    a. No dimples or bumps that require panel work extending over an area greater than a quarter of the affected panel.
    b. Corrosion must be repaired (Repair work using aluminium foil tape, etc., is not acceptable).
    c. Any rusted or exposed surfaces must be painted.
3. Interior appearance:
    a. The interior must be tidy without any excessive staining, etc.
    b. The size of any damage to the seat covers, interior walls, sealing, etc. must not exceed 10 cm for a passenger car, or 30 cm for a commercial or freight vehicle (Repair work using adhesive tape is not acceptable).
4. The windshield has no cracks or breakage greater than 1 cm.
    a. Wiper blade scratches must not obstruct the visibility of the driver.
5. The engine and other portion under the body must be cleanly washed.
    a. Rusted parts must be painted with chassis black.
6. Tyres must be in compliance with the safety regulations.
7. The odometer was not replaced or tampered.
    a. In some cases, the Odometer Certificate is required from the importing countries or the Odometer Certificate should be aggressively utilised for certain countries.
    b. The Odometer Inspection is carried out through the Individual Odometer Search System by Japan Odometer Certification Institute (JOCI).
8. Stolen vehicle check (JAAI brochure of inspection).

In order for a used vehicle to be exported from the USA, the owner must provide customs with the original certificate of title (US Customs and Border Protection, 2017).

Potential Economic, Environmental and Social Impact of Policy Change

Potential Economic, Environmental and Social Impact of Policy Change

Any policy change is expected to have an impact on the economic, environmental and social state of any country. For each of these, the impact may be both positive and negative as any policy change will benefit some and disadvantage others.

ENVIRONMENTAL IMPLICATIONS

A change in policy, regarding the importation of cleaner vehicles to African countries, will inevitably have an impact on the environment in African countries, as well as in exporting countries, as limitations to export will result in an increased number of end-of-life vehicles that need to be disposed of in exporting countries.

POTENTIAL POSITIVE ENVIRONMENTAL EFFECTS

All major environmental issues such as climate change and decreased biodiversity are interlinked with pollution. Most vehicles emit carbon dioxide and other greenhouse gases into the atmosphere through the burning of fossil fuels. The emissions of high levels of CO2 are one of the major causes of air pollution. According to the Union of Concerned Scientists (2019), fuel efficient cars use less petrol/diesel to travel the same distance than their older counterparts, thus older used cars emit more CO2 than newer cars. Furthermore, new cars are manufactured in accordance with the latest pollution control standards, whereas older cars were made using earlier technologies that were not contrived by as many regulation policies regarding their impact on the environment (Reynolds, 2018).

By regulating used vehicle importation to only allow vehicles with a Euro 4/IV or equivalent emission standard to be imported, as well as banning vehicles older than 5 years, the levels of atmospheric carbon dioxide may be decreased. This, in turn, will result in a positive environmental impact for importing countries in the long term (Union of Concerned Scientist, 2019). In many African countries, current legislation does not yet make provision for said importation limitations.

Uganda currently has no policies regulating the importation of used vehicles. The average fuel usage for the country increased from 12.52 L/100km in 2005 to 13.73 L/km in 2014. This increase has been attributed to the increase in the average age of the vehicles that were imported between 2005 and 2013 (United Nations Environment, 2017). The average age of petrol vehicles on the road in Uganda is 15,4 years, while diesel vehicles average 16,4 years (Nyamazi, 2018). Older petrol vehicles are less fuel efficient than younger vehicles and consequently produce more atmospheric carbon dioxide, contributing to air pollution. Similarly, older diesel vehicles produce more NOx (Nitrogen Oxides).

Nitrogen Oxides (NOx) are a combination of Nitrogen Oxide and Nitrogen Dioxide, which plays a major role in the reaction that causes smog. NOx mixes with water vapour in the atmosphere, creating nitric acid. Nitric acid is dispersed by the wind, eventually turning into acid rain (enviropedia.org.uk). Hydrocarbons (HC) contribute to global warming, as well as to ground-level ozone. The largest source of carbon monoxide in the atmosphere is road transport. Carbon monoxide (CO) levels are usually the highest around roads and are poisonous when inhaled. Road transport is responsible for approximately 25% of Particulate matter (PM), which is a complex mixture of organic and inorganic materials. PM is the most critical of all ambient air pollutants, as it causes the most pre-mature deaths (enviropedia.org.uk).

Regulating the importation of used vehicles to allow only vehicles that are no older than 5 years will increase the

likelihood that these vehicles will be more fuel efficient. In addition to economic advantages, due to having to purchase less fuel, the levels of ambient (outdoor) air pollution will reduce the physical and economic cost of pollution. Vehicle emissions contribute to ambient air pollution through Nitrogen Oxides, Hydrocarbons, Carbon Monoxide, Carbon Dioxide, and particulate matter. This is based on the assumption that the use of less fuel will not equal additional travelling.

In response to environmental awareness, most vehicles have been fitted with catalytic convertors since 1975. Catalytic convertors reduce harmful emissions found in vehicle exhaust emissions by reducing nitrogen oxides, as well as carbon monoxide. Catalytic convertors reduce these pollutants and toxic gasses, by transforming them into less-toxic pollutants and gasses. Catalytic convertors function as a result of the chemical reaction between emission gasses and the metals contained within, such as nickel, iron, manganese, copper and small amounts of rhodium, palladium and platinum, which are considered rare and valuable. There has been an increase in the theft of catalytic converters due to the high value of rhodium, palladium, and platinum. As a result, the likelihood of some used vehicle importers removing the catalytic converters prior to selling used vehicles has increased, to expand their profit margins. Introducing an enforced system of compliance and inspection, with an endorsed quality label, will discourage the removal of any of the environmental or safety features of a vehicle. Sellers should be held responsible if they remove any features of a vehicle, following inspection. Additionally, it will ensure that vehicles without key environmental features, are barred from importation (LEDA, n.d.).

POTENTIAL POSITIVE ENVIRONMENTAL EFFECTS (CONTINUED)

In an attempt to encourage the importation of cleaner used vehicles, some African countries have implemented age restrictions, additional taxes, and incentives for cleaner vehicles. Mauritius has set the example, demonstrating that fuel efficient vehicles have a positive impact on ambient air pollution. The age of used vehicles imported to Mauritius is restricted to three years from the date of first registration, at the time of the shipment to Mauritius. The United Nations Environment Programme (UNEP) launched the Global Fuel Economy Initiative (GFEI) and Mauritius was one

of the pilot countries. The GFEI policy uses incentives to motivate the use of hybrid vehicles. Used vehicles imported into Mauritius are taxed an additional CO2 levy, to encourage the importation of cleaner vehicles. The CO2 levy (A) is calculated as the rate of CO2 g/km (R) multiplied by the CO2 g/km (C) above the threshold of 150 g/km (T), so that A = R x (C – T). Similarly, a rebate is offered to any used vehicles imported with CO2 levels below 150 g/km (Mauritius Trade Easy, n.d.).

The Mauritius Ministry of Environment and Sustainable development (MESD) noted that the number of hybrid vehicles had doubled from 2010 to 2013. The ministry (2014) also highlighted that in the year 2005 the average level of fuel consumption was 7.0L/100km and 6.6L/100km in the year 2013. Furthermore, in 2005 the average CO2 emission was 186g/km and in 2013 it decreased to 169g/km, indicating fuel-efficient cars lead to lower levels of air pollution. The introduction of incentives to hybrid vehicle users will likely motivate African countries to import more hybrid vehicles (MESD, 2014). Hybrid vehicles are not very popular in South Africa. Wheels 24 reported that the main reason for this phenomenon was the lack of financial rebates for hybrid vehicles that are prominent in first world countries. The financial rebate that hybrid vehicle buyers receive from the government in other countries, ensures the affordability of hybrid vehicles. Additionally, in some places, such as Los Angeles, a lane has been created for hybrid and battery vehicles on all highways motivating the use of these vehicles (Wheels 24, 2014). This demonstrates the important role that government can play in motivating vehicle owners to purchase more environmentally friendly vehicles.

In 2018, the world experienced numerous natural disasters that cost the lives of thousands of people. Climate change resulted in a number of these disasters, which has caused the 1-degree above pre-industrial era rise in the Earth's global temperature. Manmade pollution, such as the carbon emissions from vehicles, is contributing to this temperature increase. This rise in temperature has led to unpredictable weather events and natural disasters. According to research by the Intergovernmental Panel on Climate Change, if global warming exceeds a 2-degree increase, it will consequently lead to higher risks of floods, extreme heat, drought and increased poverty rates (National Aeronautics and Space Administration, 2019). The Paris Climate Agreement states a limit of a 1.5□C global temperature increase from pre-industrial age temperature (Paris Climate Agreement, 2015). According to the World Meteorological Organisation (WMO), these record high temperatures are driven by the increased emissions of heat-trapping carbon dioxide. The main source of manmade carbon dioxide derives from the burning of fossil fuels, to generate power and for transport. Over the previous two centuries, fossil CO2 has shown continuous growth. In 2017 there was a 1.6% carbon emission growth and a preliminary 2% surge was reported in 2018. Air pollution has a direct and indirect effect on climate change due to the atmospheric pollutants' interaction with solar radiation. Tropospheric ozone has a negative impact on ecosystems and reduces its capacity to absorb CO2, which is created through the chemical reaction between oxides of nitrogen (NOx) and volatile organic compounds (VOC). Vehicle exhaust emissions are one of the major sources of NOx and VOC (WMO, 2019). A reduction in ambient air pollution will reduce the rate of global warming, consequently lowering the risk of natural disasters.

A relationship has been established between ambient air pollution and a range of health-related problems, such as lung diseases, ischemic strokes, cancer, diabetes etc. The burning of diesel is one of the biggest contributors to ambient air pollution. Sub-Saharan Africa has experienced a 75% increase in transport emissions between 2000 and 2016, with transport emissions increasing 153% in Ghana, 73% in Kenya, and 16% in Nigeria. Table 5 demonstrates the current health-related cost of ambient air pollution in terms of the number of deaths per 100 000, as well as an indication of what each country is currently spending on healthcare.

POTENTIAL POSITIVE ENVIRONMENTAL EFFECTS (CONTINUED)

Table 4: Cost of ambient air pollution

Rank	Country	Number of deaths/100 000 due to ambient air pollution (WHO, 2016).	% of GDP spent on healthcare
(2016)			
1	Chad	5303	4.54
2	Niger	4072	6.23
3	Nigeria	4045	3.65
4	Somalia	3653	-
5	Central African Republic	3275	4.28
6	Cameroon	3007	5.24
7	Equatorial Guinea	2594	3.38
8	Ivory coast	2551	4.4
9	South Sudan	2537	-
10	Sudan	2374	5.66
11	Benin	2365	3.86
12	Democratic Republic of the Congo	2254	3.87
13	Mali	2202	3.82
14	Egypt	2162	4.64
15	Sierra Leone	2162	16.53
16	Burundi	2052	6.19
17	Togo	2013	6.62
18	Mauritania	2001	4.24
19	Burkina Faso	1915	6.75
20	Guinea	1887	5.48
21	Guinea Bissau	1870	6.09
22	Lesotho	1843	8.08
23	Eritrea	1818	2.96
24	Uganda	1768	6.17
25	Djibouti	1763	3.5
26	Angola	1758	2.88
27	Gambia	1672	4.43

Rank	Country	Number of deaths/100 000 due to ambient air pollution (WHO, 2016).	% of GDP spent on healthcare
28	Ghana	1510	4.45
29	Ethiopia	1461	3.97
30	Republic of the Congo	1404	4.63
31	Senegal	1388	5.51
32	Comoros	1378	7.63
33	South Africa	1321	8.11
34	Tunisia	1312	6.95
35	Tanzania	1239	4.14
36	Gabon	1231	3.11
37	Libya	1222	6.05
38	Seychelles	1178	3.94
39	Zambia	1156	4.48
40	Namibia	1112	9.12
41	Madagascar	1099	6
42	Eswatini (Swaziland)	1077	7.7
43	Liberia	1029	9.62
44	Mozambique	999	5.07
45	Rwanda	997	6.76
46	Algeria	987	6.65
47	Sao Tome and Principe	986	5.99
48	Zimbabwe	984	9.41
49	Mauritius	976	5.75
50	Cape Verde	944	4.69
51	Morocco	892	5.84
52	Botswana	841	5.46
53	Malawi	771	9.83
54	Kenya	743	4.55

POTENTIAL POSITIVE ENVIRONMENTAL EFFECTS (CONTINUED)

By using cleaner used cars that meet the minimum Euro/4 IV equivalent emission standards, as well as not allowing vehicles older than 5 years to be imported, the emission levels of CO2 in the atmosphere will be lowered, leading to lower levels of air pollution. Banning vehicles without key environmental features such as catalytic convertors will ensure that imported used vehicles do not emit poisonous greenhouse gasses that contribute to global warming, as well as decreasing the cost of healthcare. Furthermore, providing incentives for hybrid vehicle use is likely to contribute substantially to combatting air pollution.

POTENTIAL NEGATIVE ENVIRONMENTAL EFFECTS

Presently, first world countries dispose of their used vehicles by exporting these vehicles to developing African countries. Nigeria is the leading buyer of used and new vehicles in Africa, with a ratio of 1:131 new to used vehicles. In 2013, 64% of the vehicles imported to Nigeria were used. The current Nigerian import policy restricts vehicles over the age of 15 years since the first registration. Collectively, in Ethiopia and Nigeria, the used vehicle market accounted for 80% of all vehicle sales in 2016. Ethiopia has no regulating policies regarding the importation of used vehicles. In Kenya, 96% of imported vehicles were used vehicles. According to the AASA (2017) report, spanning 2010 to 2014, Kenya imported 293 882 used vehicles from exporting countries, Japan, Europe, and the United States. The implementation of the proposed policy would severely restrict the vehicles that are eligible for importation. For example, if the importation policy in Nigeria is adjusted from a 15-year age restriction to a 5-year age restriction, 10 years' worth of vehicles will not be eligible for importation. Similarly, the vehicles eligible for importation to Ethiopia and Kenya will be limited.

Enforcement of the policy to limit the used vehicles imported to African countries will lead to an excess

of unused used vehicles in exporting countries. The exporting countries would have to expand their end-of-life disposal systems to accommodate this influx of vehicles. Currently, vehicle scrap yards, as well as motor vehicle recycling facilities (MVRF), are used. Approximately 85% of each vehicle is recycled and/or reused, whilst the other 15% is landfilled (Eurostat, 2019). Even though these facilities recycle the materials retrieved from unused vehicles, the potential remains to negatively impact the environment. The potential impact can occur when excess vehicle fluids such as oil, petrol or diesel, transmission-power steering, and brake fluids are mishandled, consequently leading to surface and groundwater contamination. Particles of petroleum hydrocarbons can be found in motor oil, gasoline and diesel fuels. Petroleum hydrocarbons contaminate marine life, and some are suspected or known carcinogens. This has the potential to pollute the water source directly or through storm sewers via sediment runoff and stormwater. Additionally, heavy metals can poison the water through storms, as well as the soil through the corrosion of the heavy

metal body parts. The acid from batteries can lead to soil contamination through its adverse effect on soil chemistry. These facilities also produce other waste such as sodium azide from airbags and asbestos from brake shoes and clutches (NHDS, 2019). Indicating that exporting countries will likely experience a negative environmental impact as a direct result of the proposed UN policy implementation.

South Africa is an example of the negative impact that the introduction of electric vehicles can have. South Africa has an abundance of coal, with 77% of its energy supply generated through the burning of coal, ranking it the 7th country worldwide most dependent on the burning of fossil fuels to generate energy. These coal-fired powerplants emit nitrogen oxides, sulphur dioxide, and heavy metals that contribute to ambient air pollution, as well as leading to smog, acid rain and excess toxins in the environment. These emissions increase the likelihood of developing respiratory, cerebrovascular and cardiovascular diseases. The introduction of incentives for electric vehicles in countries like South Africa would inevitably lead to the burning of more coal to generate the electricity required for electric vehicles. Short of, the prior implementation of green electricity initiatives to obliterate the air pollution of coal-generated energy, countries like South Africa, cannot encourage the use of electric vehicles (Shawe, 2018).

POTENTIAL ECONOMIC IMPACT

Limiting the vehicles that are imported into African countries will inevitably have an impact on the economy, on an individual as well as the national level, in importing, as well as exporting countries.

POTENTIAL POSITIVE ECONOMIC IMPACT

Road crashes are associated with irresponsible road users, inapt road infrastructures, unroadworthy vehicles, and environmental conditions. Road accidents are responsible for 25-30 reported deaths per 100 000 in African countries compared to the global average of 17.4/100 000. To ensure that vehicles are in working condition, some countries administer roadworthiness tests to determine whether a vehicle is safe to drive. The South African roadworthiness test, for example, evaluates the body of the vehicle; it should be rust free, doors and handles must open easily, there should be no cracks on the windscreen and should be fitted with at least one wiper, all windows should be able to open and close, all lights and indicators must be in working order, headlights must be fully functioning, and all lights must be securely fitted. The tread on all tyres must be 1.66mm and the size must adhere to vehicle manufacturer's specifications. Brakes must be in good working condition and the brake discs must not be grooved or concave. The chassis should be stable and undamaged, the undercarriage should show no signs of fluid leaks or rust. The shock absorbers should not be worn out. The exhaust mounting must be secured and should not have visible smoke emission or damage. The engine should show no leaks, damage, visible or loose wires. The battery must be clean, secured and have the required number of clamps. The interior, the hooter, odometer, and speedometer must be in working condition. Seats must be secure and undamaged. Lastly, all seatbelts must be operational. These are the basic standards a vehicle must adhere to ensure the roadworthiness of a vehicle (AASA, 2017). Approximately half of African countries do not enforce roadworthiness tests prior to allowing vehicles on the road. In East Africa, 36% of the countries enforce roadworthiness and there is an average of 34.7 deaths per 100 000 comparing to Central Africa where 50% require roadworthiness tests, with an average of 28 deaths per 100 000. Unroadworthy vehicles are a main contributing factor to road accidents (DEKRA, 2015). Burst and smooth tyres, faulty brakes and steering issues are some of the leading causes of road accidents related to unroadworthy vehicles. Ensuring that imported used vehicles are safer, will decrease the number of road-related deaths and injuries, decreasing the cost related to the aforementioned. In addition, decreased road-related injuries may lead to higher levels of productivity, improving individual and national economic standings.

POTENTIAL POSITIVE ECONOMIC IMPACT (CONTINUED)

Studies have illustrated a link between pollution, health problems, lower levels of education and income. As mentioned, older vehicles emit more poisonous greenhouse gasses than newer vehicles, which leads to higher risks of health issues, such as respiratory and cardiovascular diseases. There is a causal link between in-utero exposures to pollution and long-term health issues (Prinz, 2018). In addition, there is a correlation between poor health and lower levels of labour market success. A study done in Texas found that when carbon dioxide emission levels were higher, school attendance declined (Curie, 2019). When exposed to lower levels of air pollution, children exhibited higher academic performance compared to those exposed to higher levels of pollution (Isen, Slater, Walker, 2017). Indicating that pollution-related health issues may have a negative impact on an individual's occupational and educational productivity, with the potential to impact the individual's work and earning potential. In other words, pollution has a negative impact on children's health and consequently affects their future prospects, which in turn leads to a poorer labour market. Subsequently, introducing the policy, proposed by the UN, will lead to lower levels of pollution which in turn will have a positive effect on an individual's future work and income prospects and increase productivity in the labour market.

The major pollutants for public health concern include, particulate matter (PM), ozone (O3), nitrogen dioxide (NO2) and sulphur dioxide (SO2). The burning of fossil fuels, such as coal, lead to sulphur dioxide. Motor vehicles emit nitrogen dioxide and is one of the three leading sources of secondary PM. Unclean older vehicles have a higher impact on these pollutants due to increased fuel usage and higher levels of nitrogen oxide emissions. There is a causal link between poor health and ambient pollution. Exposure to ambient air pollution can lead to cardiovascular, respiratory and lung diseases. Furthermore, maternal exposure is associated with adverse birth outcomes. Evolving evidence supports the notion that exposure can affect neurological development and diabetes in children. These ambient pollution health-related problems consequently have an economic and social impact on individuals. The individual will most likely have increased health expenses compared to a healthy individual. Health also plays a significant role on an individual's wellbeing, their ability to complete education successfully, and live a productive life. Individuals living with pollution related diseases such as lung cancer experience difficulties performing daily or previously enjoyed activities which leads to feelings of frustration, sadness and depressive like symptoms. Reduced pollution levels, will consequently, improve overall life quality.

In Sub Saharan Africa, vehicle emissions are one of the largest contributing factors to ambient air pollution. In 2015, 500 000 lost their lives to pneumonia in sub-Saharan Africa. Ambient air pollution is one of the main contributing factors of pneumonia, as well as increasing the risk of developing asthma, lung cancer and other health related problems. This increased risk places an immense financial weight on the respective countries' health care systems. As well as the cost of lost productivity, due to the high fatality rates of conditions associated with ambient air pollution (Asiedu, 2018).

In 2016, Sierra Leone spent 15,53% of their Gross Domestic Product (GDP) on health care, losing 2162/100 000 people as a result of conditions related to ambient air pollution (WHO, 2016). Malawi, spent 9.83% of GDP on health care, losing 717/100 000 people as a result of conditions related to ambient air pollution. Similarly, Liberia spent 9.62% of GDP and lost 1029/100 000 people (WHO, 2016). Limiting the age of the used vehicles imported, will decrease the level of ambient air pollution, as newer vehicles are more environmentally friendly, than older vehicles, placing less of a financial burden on the health sectors of African countries.

A causal link has been established between climate change and natural disasters. Natural disasters have short- and long-term economic impact on a country. Climate induced disasters cost nations $100 billion

worldwide in 2018 (Christian Aid, 2018). Small business owners often experience business disruptions, and cannot carry the high cost of renovating the damaged property, consequently losing their main source of income. The agriculture sector and specifically farmers, are affected by damage to their crops and machinery. Relocation has the largest economic impact. Developing countries are more vulnerable to structural damage from natural disasters, as housing is not always properly built or maintained. Furthermore, developing countries have fewer warning systems in place and less financial capacity to assist the displaced population and restore the damaged infrastructure. In September 2018, Nigeria was hit with a flood that led to 200 people losing their lives, as well as affecting approximately 2 million people. Similarly, in 2018, record high temperatures were recorded in parts of North Africa, where Algeria reached a nation record high of 51.3°C. In mid-August 2016, Lesotho received an unusual accumulation of 5-30cm snow fall which normally occurs much earlier in the winter season. Flooding affected East Africa, in Kenya, Tanzania and Somalia where the average rainfall doubled and was collectively responsible for over 100 deaths (WMO, 2018). Climate variability and extremes are a key driver behind the recent rise in global hunger, as well as one of the leading causes of severe food crises. Hunger is significantly worse in countries with agricultural systems that are highly sensitive to rainfall, temperature variability and severe drought, and where the livelihood of a high proportion of the population depends on agriculture. The countries with high exposure to climate extremes have more than double the number of undernourished people as those without high exposure (WMO, 2018).

POTENTIAL POSITIVE ECONOMIC IMPACT (CONTINUED)

Climate events in 2017 had the largest impact to date on acute food insecurity and malnutrition in Africa, affecting 59 million people in 24 countries and requiring urgent humanitarian action. Much of the vulnerability to climate variability is associated with the dryland farming and pastoral rangeland systems supporting 70%–80% of the continent's rural population. Globally, 40 countries, of which 31 are on the African continent, continue to be in need of external assistance for food. Persisting civil conflicts, together with climate-induced production declines have negatively affected food availability. In 2018, unfavourable weather conditions limited Southern African cereal outputs and heightening food insecurity, while ample rains in East Africa boosted production prospects, but also resulted in localised flooding that caused food insecurity (WMO, 2018). Food insecurities have a negative impact on economic standings, as importation of food increases by necessity. The amount of ambient air pollution contributed by used vehicles, through carbon emissions, will be decreased as newer vehicles are imported with improved environmental features, reducing the likelihood of unforeseen financial impacts. Reduced ambient air pollution, has the potential to reduce global warming, resulting in more stable food supplies.

In addition to the overall economic impact to societies, such as natural disasters, food instability, and health sector costs, individual economic impacts should be taken into consideration. This economic impact will only be relevant to those that can afford vehicles. The most common issues affecting motorists are rising fuel costs, maintenance costs and unexpected repair expenses. Older used vehicles are less fuel efficient, as well as incurring inflated maintenance and unexpected repair costs, as the vehicle ages. It is unlikely to have to perform major maintenance before 50 000 miles, brake pads are customarily the primary maintenance needed thereafter. After 100 000 miles and throughout the remainder of a vehicle's lifespan, the likelihood of engine troubles occurring continues to rise sharply. Furthermore, second-hand vehicles' most likely problem is the engine failing to start, this likelihood increases sharply from 30% after 100 000 miles to 75% by the end of the vehicle's lifespan. On average, maintenance will cost $1400 for the first 25 000 miles, $3400 for 100 000 miles, and at 200 000 miles, maintenance will be approximately

$5000 (Colchin Automotive, n.d.). The introduction of policies that promote cleaner and newer vehicles that need less maintenance, will lead to lower expected and unexpected monthly expenses to second hand vehicle owners. Introducing new policies may have a positive economic impact on some role players, however the impact may be negative to other role players.

POTENTIAL NEGATIVE ECONOMIC IMPACT

Second hand vehicle owners will benefit from newer vehicles that require less maintenance. However, auto dealerships in these countries are financially reliant on providing maintenance and repair services. A decrease in the maintenance and repairs required, will result in a fiscal decrease in their overall income. This increases the likelihood of auto technician retrenchments and lowers their job opportunities, which can contribute to an increased unemployment rate. Most African countries already have a problem with unemployment and poverty, evidenced in Table 6. Furthermore, a decrease in the amount of fuel sold, may cause job losses in the petroleum industry. This will only be the case if more fuel-efficient vehicles, are used for the same amount of travel. If motorists increase the amount of travel to match their current fuel expenses, the petroleum industry will not be affected. Currently South Africa is exporting fuel to 45 out of the 54 African countries, to varying degrees (Table 7). The South African Petroleum Industry Association (2017) has sustained 96 711 direct jobs and 697 706 indirect jobs. It has contributed R6.5 billion (approximately US$ 42,7 million) to the total household income in South Africa, with 3.0% going to lower income households and increased government revenue by R90 billion (approximately US$ 5.9 billion) in the year 2017.

The implementation of policy changes will have financial implications for the participating countries' economy on both, governmental and individual level. A regulating agency will have to be implemented in both the exporting and importing countries to evaluate whether the vehicles are meeting the importing and exporting standards. Administrative personnel, auto technicians, structures and resources will be needed to implement these regulations. The respective governments will have to introduce these expenses into their annual budget, with the initial stage demanding more financial input due to the construction of the buildings and employment of staff in a new department without any prior income. There are various options to retrieve funds for the implementation, such as a fuel tariff that goes towards the implementation. A fuel levy, however, will increase the cost of fuel, enlarging the economic pressure on individual households. Alternatively, the importer or exporter can carry the quality label related costs, increasing the cost of the vehicle to the final buyer. The banning of older vehicles will already increase the average price of imported used vehicles, as newer models are generally more expensive. Additionally, the limitation of the age range of the vehicles that are imported, will impact the availability of used vehicles. Reduced availability, or a change in the demand-availability ratio, will drive the prices of imported used vehicles up. Most African countries import used vehicles due to affordability, which may not be a benefit anymore. This will lower the level of access to transportation, which can also affect accessibility to work, increasing unemployment and poverty levels.

An increase in the price of imported used vehicles, as well as a decrease in the number of vehicles available, will however be beneficial to local new vehicle producers, by closing the price gap between used and new vehicles, increasing the attractiveness of new vehicles.

Table 6 ranks the African countries according to the percentage of the population that is economically active, Mozambique is the country with the largest percentage of economically active population, yet Mozambique is ranked 45th in terms of their Gross National Income per capita, and 39th in the number of people living below the international poverty line. The economic standing of a country is comprised of each of these factors.

Table 5: Economic standings per country

Percentage of population economically active (%)

1st	Mozambique	55.33%
2nd	Madagascar	50.49%
3rd	Ethiopia	49.57%
4th	Rwanda	49.20%
5th	South Sudan	48.93%
6th	Mauritius	48.51%
7th	Zimbabwe	47.81%
8th	Uganda	47.04%
9th	Guinea	46.47%
10th	Burundi	45.48%
11th	Ghana	44.24%
12th	Eritrea	43.97%
13th	Central African Republic	43.91%
14th	Cameroon	43.88%
15th	Togo	43.12%
16th	Cape Verde	42.02%
17th	Burkina Faso	41.97%
18th	Tanzania	41.68%
19th	Benin	41.01%
20th	Malawi	40.83%
21st	Guinea Bissau	39.78%
22nd	South Africa	39.26%
23rd	Republic of the Congo	37.26%
24th	Democratic Republic of the Congo	36.94%
25th	Zambia	36.39%
26th	Sierra Leone	36.38%

27th	Kenya	35.90%
28th	Angola	33.08%
29th	Ivory coast	33.05%
30th	Liberia	32.88%
31st	Mali	32.53%
32nd	Morocco	32.27%
33rd	Tunisia	31.27%
34th	Egypt	31.24%
35th	Comoros	30.94%
36th	Algeria	30.29%
37th	Niger	30.10%
38th	Libya	30.02%
39th	Lesotho	29.87%
40th	Nigeria	29.72%
41st	Sao Tome and Principe	29.38%
42nd	Senegal	29.10%
43rd	Gambia	29.08%
44th	Namibia	28.00%
45th	Somalia	26.74%
46th	Sudan	25.14%
47th	Gabon	24.39%
48th	Botswana	22.29%
49th	Eswatini (Swaziland)	22.28%
50th	Mauritania	20.86%
51st	Djibouti	15.27%
52nd	Equatorial Guinea	5.95%
53rd	Chad	0.04%
54th	Seychelles	0.00%

Table 5: Economic standings per country

GNI per capita (US$)

1st	Equatorial Guinea	27 200 US$	14th	Angola	6 470 US$
2nd	Seychelles	25 670 US$	15th	Cape Verde	6 320 US$
3rd	Mauritius	19 940 US$	16th	Republic of the Congo	6 320 US$
4th	Gabon	18 880 US$	17th	Nigeria	5 810 US$
5th	Botswana	15 510 US$	18th	Ghana	4 080 US$
6th	Algeria	14 310 US$	19th	Sudan	3 990 US$
7th	South Africa	12 870 US$	20th	Mauritania	3 710 US$
8th	Tunisia	11 100 US$	21st	Zambia	3 640 US$
9th	Libya	11 040 US$	22nd	Lesotho	3 290 US$
10th	Egypt	10 710 US$	23rd	Ivory coast	3 260 US$
11th	Namibia	10 380 US$	24th	Sao Tome and Principe	3 250 US$
12th	Eswatini (Swaziland)	8 260 US$	25th	Kenya	3 070 US$
13th	Morocco	7 690 US$	26th	Cameroon	3 070 US$

27th	Tanzania	2 630 US$
28th	Senegal	2 380 US$
29th	Chad	2 110 US$
30th	Benin	2 050 US$
31st	Mali	1 970 US$
32nd	Uganda	1 820 US$
33rd	Rwanda	1 720 US$
34th	Zimbabwe	1 710 US$
35th	Burkina Faso	1 660 US$
36th	South Sudan	1 630 US$
37th	Ethiopia	1 620 US$
38th	Gambia	1 580 US$
39th	Sierra Leone	1 560 US$
40th	Comoros	1 490 US$
41st	Guinea Bissau	1 450 US$
42nd	Madagascar	1 410 US$
43rd	Eritrea	1 400 US$
44th	Togo	1 330 US$
45th	Mozambique	1 170 US$
46th	Malawi	1 140 US$
47th	Guinea	1 120 US$
48th	Niger	950 US$
49th	Burundi	730 US$
50th	Liberia	720 US$
51st	Democratic Republic of the Congo	720 US$
52nd	Central African Republic	620 US$
53rd	Djibouti	-
54th	Somalia	-

Table 5: Economic standings per country

% below international poverty line

1st	Seychelles	0.40%
2nd	Mauritius	0.50%
3rd	Tunisia	2.00%
4th	Equatorial Guinea	2.00%
5th	Morocco	4.80%
6th	Mauritania	10.90%
7th	Sudan	14.90%
8th	South Africa	16.60%
9th	Cape Verde	17.60%
10th	Botswana	18.20%
11th	Djibouti	18.30%
12th	Namibia	22.60%
13th	Republic of the Congo	28.70%
14th	Ivory coast	29.00%
15th	Cameroon	29.30%
16th	Angola	30.10%
17th	Uganda	33.20%
18th	Ethiopia	33.50%
19th	Sao Tome and Principe	33.90%
20th	Guinea	35.30%
21st	Senegal	38.00%
22nd	Chad	38.40%
23rd	Eswatini (Swaziland)	42.00%
24th	Tanzania	46.60%
25th	Mali	49.30%
26th	Niger	50.30%

27th	Sierra Leone	52.30%	41st	Democratic Republic of the Congo	77.20%
28th	Benin	53.10%	42nd	Burundi	77.70%
29th	Nigeria	53.50%	43rd	Madagascar	81.80%
30th	Togo	54.20%	44th	Zimbabwe	-
31st	Burkina Faso	55.30%	45th	South Sudan	-
32nd	Liberia	56.30%	46th	Somalia	-
33rd	Lesotho	59.70%	47th	Kenya	-
34th	Rwanda	60.30%	48th	Ghana	-
35th	Zambia	64.40%	49th	Gambia	-
36th	Central African Republic	66.30%	50th	Gabon	-
37th	Guinea Bissau	67.10%	51st	Eritrea	-
38th	Libya	68.60%	52nd	Egypt	-
39th	Mozambique	68.70%	53rd	Comoros	-
40th	Malawi	70.90%	54th	Algeria	-

POTENTIAL SOCIAL IMPACT

Enforcing second-hand vehicle import and exportation policies will not only influence the environment and the economy, but it will also have an impact on the quality of life of individuals in African nations.

POTENTIAL POSITIVE SOCIAL IMPACT

Studies have shown that there is a link between pollution, health related problems and lower levels of income and education. Older vehicles emit more carbon dioxide, which is a major contributing factor to ambient pollution. Individuals living in areas with high levels of ambient pollution, have a higher risk of developing asthma and other chronic heart and lung diseases. These diseases have a significant effect on the individual's wellbeing and consequently increases their monthly health related expenses. Ambient pollution also affects the ability to perform cognitive tasks, which in turn leads to lower levels of income and education. Implementing policies that will lower the levels of carbon emissions, can therefore have a positive effect on individual's health and concurrent economic standings.

In order to implement the policy suggested by the UN, administrative personnel, auto technicians, structures and resources will be needed to regulate and enforce the afore mentioned. The majority of African countries have high unemployment rates. These policies will create sustained job opportunities in the respective countries which will increase their global economic standings in the long-term.

Vehicle carbon emissions also currently contribute to the rise of the global temperature which is leading to unpredictable weather events and natural disasters. African countries are more vulnerable to natural disasters, as a result of fewer warning systems in place and less financial capacity to assist those who are affected. Relocation has the biggest economic and individual impact. Likewise, small business owners and farmers have an increases risk of losing their main source of income due to the inability to repair the damages. The likelihood of volatile natural disasters and weather events can be lowered with the implementation of clean vehicle policies. Government, business owners and residence will consequently experience positive fiscal benefits.

Unroadworthy vehicles are one of the leading factors of road accidents. It can bring about physical, financial and mental difficulties for all parties involved. Bystanders and passengers can suffer from long-term neuropsychological problems, bruises, minor cuts, broken limbs, whiplash, spinal and back injuries, paralysis and even demise. In addition, road accidents significantly increase traffic congestion, which may result in loss of business, disciplinary action and other personal losses due to late arrival for meetings, employment and/or education. Guaranteeing that imported second-hand vehicles are more secure, will lower road accident fatalities and governmental and individual expenses. Additionally, less road related injuries, can increase productivity which in turn may improve national and individual quality of life.

The most well-known issues influencing drivers are rising fuel costs, unexpected repair and maintenance expenses. New vehicles tend to be more fuel efficient, require less unexpected repairs and only need maintenance at a later stage. The introduction of policies such as only allowing vehicles with Euro 4/IV or equivalent emission standard to be imported, as well as banning vehicles older than 5 years will decrease the emission levels of carbon dioxide. In addition, motorist will spend less unexpected expenses on maintenance and save money on fuel. By decreasing air pollution and motivating cleaner cars, individuals will experience improved personal and financial quality of life.

POTENTIAL NEGATIVE SOCIAL IMPACT

The implementation of second-hand vehicle import and export policies, such as inspections and a quality label, will most likely lead to additional cost when buying an imported second-hand vehicle. There are various ways of procuring the funding for the implementation of

these policies. Funding can be retrieved from increased fuel levies and/or taxes or the importer can carry the cost by increasing the selling price. However, the majority of African countries are dependent on second-hand vehicles due to the affordability of the vehicles. This increased cost will negatively affect the percentage of the population that can currently only afford the lower-priced imported vehicles. Vehicles allow people easy access to work and school. Majority of African countries do not have adequate public transport and the people are consequently dependent on private transport. Additionally, majority of individuals who provide public transport make use of affordable imported second-hand vehicles, which is also their main source of income. Therefore, the increased cost due to policy changes can negatively attribute to loss of income and individual welfare.

These negative impacts will only be short term and only those that purchase vehicles immediately after importation will directly be impacted. A 5-year old vehicle will soon be a 10-year old vehicle and the second African owner will not be impacted by the price increase, as a vehicle can only be sold at a price that is market related. This second-hand African market (third-hand from production) will still only be willing to pay what is considered affordable to them.

Similarly, auto-technicians will likely experience a decrease in quality of life due to a reduction in business from vehicles not needing as much maintenance as before. Reduced second-hand vehicle availability and age variability, as well as less access to transport, can result in less access to jobs and schooling, which will negatively impact the quality of life of individuals in African countries.

These negative impacts too, will only be short-term as vehicles continue to age in African countries.

Challenges to policy implementation

Challenges to policy implementation

FUEL SPECIFICATIONS

South Africa currently exports fuel to 49 of the 54 African countries.

Table 6: US Dollar value of fuel imported from South Africa to other African countries

		CONGO, REP. 16 321.85	ETHIOPIA (Excludes Eritrea) 2 773.69
ALGERIA 6.43	BURUNDI 320.12	COTE D'IVOIRE 13 204.15	GABON 1 057.02
ANGOLA 40 720.39	CAMEROON 933.08	DJIBOUTI 75 036.34	GAMBIA 213.36
BENIN 2 918.21	CENTRAL AFRICAN REPUBLIC 0.25	EGYPT, ARAB REP. 59 080.75	GHANA 4 269.50
BOTSWANA 638 421.43	COMOROS 136.49	EQUATORIAL GUINEA 96.14	GUINEA 98.85
BURKINA FASO 130.68	CONGO, DEM. REP. 65 428.54	ERITREA 1 679.61	KENYA 37 875.73

LESOTHO
196 765.95

MAURITIUS
120 403.25

SENEGAL
41 305.47

TANZANIA
7 293.45

LIBERIA
638 421.43

MOROCCO
52 376.87

SEYCHELLES
414.51

TOGO
59 314.93

LIBYA
149.93

MOZAMBIQUE
442 276.28

SIERRA LEONE
992.91

TUNISIA
0.17

MADAGASCAR
52 195.27

NAMIBIA
284 523.68

SOMALIA
6.36

UGANDA
1 316.62

MALAWI
12 972.05

NIGERIA
3 643.29

SOUTH SUDAN
0.39

ZAMBIA
145 320.23

MALI
186.08

RWANDA
863.03

SUDAN
471.52

ZIMBABWE
236 710.41

MAURITANIA
721.66

SAO TOME & PRINCIPE
27.89

SWAZILAND
197 320.30

FUEL SPECIFICATIONS (CONTINUED)

Catalytic convertors are prone to fouling, as a result of the sulphate content in the fuel. As sulphate levels increase, the hydrocarbon emissions increase by a small amount, while the CO and NOx emissions increase by a larger amount. Sulphate particles block or deactivate the catalytic convertor. Metal additives to petrol, used to increase octane levels and avoid engine knocking or pinging, have a similar effect on the catalytic convertor (Orbital Australia, 2013).

Clean Fuels I (CFI), which removed the lead from petrol, was implemented on 1 January 2006 in South Africa. Leaded petrol was replaced by lead-replacement petrol, which too was phased out of production. The South African Department of Energy published regulations for petrol and diesel production, based on Euro Level V specifications, which was amended in the Government Gazette of 3 June 2016, named Clean Fuels II (CFII). The aim, of these specifications, is to align fuel quality with improved vehicle technology, as well as to reduce the environmental impact of vehicle emissions. The table below outlines the differences between CFI, Euro V, and CFII, in terms of petrol and diesel specifications.

Table 7: Standards comparison of CFI, Euro Level 5, and CFII (Petrol)

Petrol	CFI	Euro V	CFII
Sulphur (mg/kg)	500	10	10
Aromatics (Vol %)	50	35	35
Benzene (Vol %)	5	1	1
Reid Vapour Pressure (kPa)	45-75	45-60	45-65
Olefins (Vol %)	-	18	18

Table 8 Standards comparison of CFI, Euro Level 5, and CFII (Diesel)

Diesel	CFI	Euro V	CFII
Sulphur (mg/kg)	500 (50)	10	10
PAH (%m/m)	-	8	11
Cetane Numbers	45	51	51
Distillation T90 (°C)	362	-	-
T95 (°C)	-	360	360
Density (kg/m3)	-	845	845
Flash (°C)	(55)	55	55

Although CFII was scheduled to take effect on 1 July 2017, it has as of yet not been implemented. Additionally, the Government Gazette of 1 June 2016 3(d), indicates that the manganese-based additives in permitted unleaded petrol grades must not exceed 18 mg/L. Implying that CFII will allow manganese, a metal, to be added to petrol, which will in turn cause damage to catalytic convertors. CFII will reduce the sulphur levels in fuel, improving the functioning of catalytic convertors. However, the chemical process reducing the sulphur content in fuel, also reduces the octane levels. Consequently, all the African countries, that import fuel from South Africa, are affected, not only by the current fuel quality, but by any future fuel specification adjustments.

IMPACT TO GOVERNMENT TAX

More fuel-efficient vehicles, will inevitably make use of less fuel, reducing the amount of government tax that is collected from the sale of fuel. In South Africa, for example, approximately 35-40% of the cost of fuel is allocated to tax, depending on the type of fuel, the grade of fuel, as well as where the fuel is purchased (Central Energy Fund, 2019).

In Togo, a monthly review is done on the cost of fuel, which is defined as the sum of:

i. import price;
ii. costs and margins for storage, transportation, distribution, and retail sale;
iii. taxes (custom duties, excises, and VAT);
iv. a specific levy to repay old state debt towards oil importers; minus,
v. a variable subsidy to minimize changes in domestic retail price, notwithstanding international price and exchange rate movements (IMF working paper WP/15/17, Feb. 2016).

Ghana, requires individuals licensed to operate as oil marketing companies to charge a special petroleum tax per litre or kilogramme. The special petroleum tax is added to petrol, diesel, liquefied petroleum gas, natural petroleum gas, and kerosene (PWC, 2018).

If a substantially lesser amount of fuel is sold, government revenue, in countries that levy a fuel tax, will be negatively impacted. Resultantly, this gap in government revenue will need to be augmented by an alternative source. The potential reduction of government revenue may result in resistance to the implementation of the proposed policy.

VEHICLE SUPPLIERS IN EXPORTING COUNTRIES

Presently, a relatively high vehicle turnover rate exists exporting countries. As in the example of Nigeria, the proposed policy will render 10 years' worth of used vehicles ineligible for import into the country. A vehicle owner in an exporting country (in this case most likely from the US), may have a vehicle that is 6 years old, which was intended to be sold to a Nigerian used vehicle dealer. However, as the vehicle can no longer be exported, and the owner cannot expect the same value for the vehicle in the US, the owner reaches the decision to keep the vehicle longer. Instead of purchasing a new vehicle, and stimulating the new vehicle market in the exporting country, the used vehicle remains in use in the origin country until it reaches an end-of-life condition. Consequently, two additional issues arise, new vehicle sales slowdown and the disposal at the end-of-life stage of the vehicle remains the responsibility of the origin country. Additionally, reducing the number of vehicles that are exported to African countries, by up to two thirds, will flood the used vehicle market in the origin countries. The influx of used vehicles will likely drive the price of used vehicles down, enlarging the gap between the cost of a new vehicle and that of a used vehicle. Profit margins for used vehicle dealers in exporting countries will decrease, as the competitive pricing of used vehicles increase. Both the new vehicle lobby and the used vehicle lobby, in exporting countries, are not likely to support the implementation of the, at the cost of their own profit.

DISPOSAL OF END-OF-LIFE VEHICLES IN ORIGIN COUNTRIES

The second issue that arises as a result of the influx of used vehicles that are not eligible for export to African countries, is the disposal of used vehicles when an end-of-life condition is reached. Exporting countries would be forced to expand their end-of-life disposal systems to accommodate the influx of end-of-life vehicles. Currently, vehicle scrap yards as well as motor vehicle recycling facilities (MVRF) are used. Approximately 85% of each vehicle is recycled and/or reused, whilst the other 15% is landfilled (Eurostat, 2019). Besides the negative environmental impact of disposing of more end-of-life vehicles, the economic costs of the expansion of recycling facilities and landfills are significant.

LAW ENFORCEMENT

Policing, and law enforcement in general, have a chequered past in many African countries. Policing began as a means to force the implementation of colonial rule, a politicised force suppressing local rebellions. After gaining independence, police forces struggled to remain free of political powers, for instance in countries with civil conflicts, or under authoritarian rule. This history continues to influence the public perception of law enforcement, impacting on the effectiveness of policing (Robins, 2009).

The Sierra Leone police force was established in the early 1990's, as a non-political force, in reaction to high levels of corruption in the 1980's. The capacity and resources of the police force was almost destroyed during the period of civil unrest, following their establishment. Poor conditions, unsatisfactory remuneration, and a lack of resources, has resulted in high levels of corruption. The general public perception of the police force has remained negative (Robins, 2009).

The Tanzanian police force, in conjunction with the people's militia, share the burden of law enforcement. The militia is a tool of the authorities, but are not well trained, often violating the rights of citizens. The police force is subject to ethical oversight, while the militia are not. This creates the impression that the militia was established to circumvent the law. The police force suffers from an inadequate supply of resources, staff members, poor conditions, and corruption. In addition, police officers are pressured by political powers, as well as by mob justice (Robins, 2009).

The Zambian police force is under pressure as a result of a severe lack of human resources. Corruption and human rights violations have remained an issue. Further, the public perception of the force is negative, and many crimes go unprosecuted (Robins, 2009).

The main issues in these three countries, as well as in other African countries, are politicisation, inadequate resources, untrained and/or unethical staff, negative public perceptions, corruption, and a lack of effective oversight (Robins, 2009). Implementing any regulations or policy changes, will require effective monitoring and enforcement, however, this may not lie within the capabilities of some African countries.

SMUGGLING OF VEHICLES

The precise number of used vehicles imported into African countries annually, remains unclear, as a result of aggregated reporting, a lack of reporting, and the smuggling of used vehicles. Smuggling of used vehicles as become common practise in some African regions. On the border between Benin and Nigeria, workshops producing forged Nigerian registration documents and license plates operate openly (Fadahunsi & Rosa, 2002). Corrupt border officials in some countries, are motivated by bribes, to lower the duties and tariffs of used vehicles, by valuating these vehicles at below market rates (Brooks, 2012). Some importers opt to import used vehicles through ports in countries with lower tariffs and/or less strict regulations, and then to move the vehicles into the target markets (Brooks, 2012).

In some instances, the used vehicle market is controlled by a cartel, demanding a percentage of every vehicle sold. These practises have led to unclear importation data, as well as an inability to implement regulations on imported used vehicles.

Conclusions and Recommendations

Conclusions and Recommendations

Policy reform is required in all African countries, whether it is a complete policy reform, for countries with no import restrictions, or an expansion of current policy, for countries with policies that do not meet all the requirements.

The AA of South Africa, supports the following policy, tentatively suggested by the UN, summarised these requirements are:

- The development of an endorsed used vehicle quality label, displayed on all used vehicles exported and imported;
- A minimum of Euro 4/IV or equivalent emission standards;
- A maximum vehicle age of 5 years old;
- The banning of export or import of zero-rated, as well as one star-rated, NCAP vehicles;
- Key safety features are in place and in working order;
- Key environmental features are in place and in working order;
- Repaired vehicles with an accident history of compromised structural integrity banned from export;
- Incentivise the import of low to zero carbon and electric used vehicles;
- Provide maintenance support for cleaner vehicle technology;
- Provide aftermarket support.

The effectivity of the requirement to meet Euro 4/IV or equivalent emissions standards, will depend on the fuel quality standards in the respective countries. Similarly, the incentivisation of the importation of electric (or hybrid vehicles that make use of electricity), can only take place in countries that do not make use of fossil fuel generated electricity, to ensure the environmental benefits of the requirement.

All used vehicles imported to an African country should meet the Global NCAP Fleet Safety Guidelines and Safer Car Purchasing Policy (2018-2019), which includes:

Must have requirements

1. Braking UN Regulation 13
2. Seat belt anchorages UN Regulation 14
3. Safety belt and restraint systems UN Regulation 16
4. Frontal collusion protection UN Regulation 94
5. Side collusion protection UN Regulation 95
6. Pedestrian safety UN Regulation 127/GTR 8
7. Electronic stability control UN Regulation 140
8. Isofix anchorages UN Regulation 145

Highly recommended requirements

1. Advanced emergency braking systems UN Regulation 131
2. Pole impact protection UN Regulation 135

In addition to implementing these requirements, data collection and tracking of the exporting and importing of used vehicles is indispensable. Transparent consumer information systems will allow consumers to make better choices when purchasing a used vehicle. Harmonised registration systems across importing countries, will enable the improved monitoring of used vehicle imports, as well as provide information to policy makers. Support systems will be desirable, to assist importing countries with the enforcement of policies. Furthermore, awareness campaigns are required across all exporting and importing countries. All of these objectives will greatly benefit from the establishment of a sustainable Safer and Cleaner Used Vehicle Fund. Paramount to the success of the Promoting Safer and Cleaner Used Vehicles for Africa policy, is the support of government. The support of government will assist greatly to overcome several of the challenges to policy reform, such as law enforcement, smuggling and fuel quality. With the support of government law

enforcement can be improved substantially, leading to the reduction of smuggling in African countries. Additionally, governments are in a position to set fuel quality standards for the importation of fuel.

The most appropriate used vehicle policy reform may be to phase the changes into some of the continental blocs, where the discrepancy between current policy and the proposed policy is larger. This should specifically be the case for East Africa, where 10 of the 14 countries currently have no policy regarding the importation of used vehicles. Similarly, 9 of the 16 countries in West Africa, and 3 of the 8 Central African countries, have no policies restricting the importation of used vehicles. Of the Eastern, Western and Central African countries only 5 have age restrictions for imported vehicles of five years or less. The proposed policy will require some adaptation, to allow effective phasing out of imported vehicles that do not meet the requirements, over a reasonable amount of time.
The policy could immediately be implemented in Northern Africa, as four of the six countries already ban the importation of used vehicles, and the other two meet the age requirement of five years. Therefore, the policy changes required in Libya and Tunisia, will merely have to include minimum safety standards, environmental standards, and quality testing.

The vehicles that are presently on the roads in Africa, are of concern too. The average vehicle on the road in Africa, is older than the average age in regions such as the U.S., Japan, or the EU. The vehicles that are imported, will be on the road until, they have reached their end-of-life condition. Current disposal strategies of these vehicles are not environmentally friendly. Future research should look into the feasibility of creating a system, wherein recycling plants are built in Africa, and the recycled raw material is sold back to the origin countries of the vehicles. A system that offers a payment to the owner, when a vehicle is sold to the recycling plant, may reduce the average age of vehicles on the road, by motivating (and assisting) the purchase of new vehicles. This may reduce the likelihood of an owner driving a vehicle after it has reached its typical end-of-life stage, empowering the owner in the process. In addition, the erection of recycling plants in Africa could alleviate unemployment, stimulate economic growth, as well as reinforce international trade, in the process of reducing pollution.

Limitations

The largest limitation to this study, is the lack of accurate data of used vehicles imported into African countries annually. It becomes difficult to address a problem, when the magnitude of the problem cannot be defined in clear terms. The true impact of any policy change cannot be measured until it has been implemented, therefore, the impacts discussed in this report are based on historic research and prediction.

Country Profiles

Country Profiles

Table 9: Country Profiles North Africa

Average Gross national income (GNI)

9 806.67

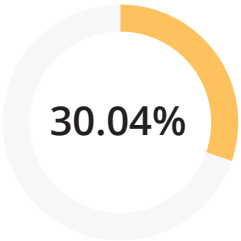
Total Population ('000)
222 486.00

Average Population per country ('000)
37 081.00

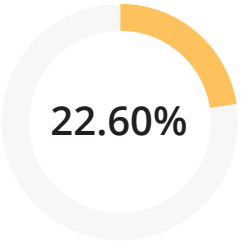
Total Economically active population ('000)
259 568.67

Average Economically active population ('000)
11 165.58

ALGERIA
EGYPT
LIBYA
MOROCCO
SUDAN
TUNISIA



Average % of population economically active



Average % below international poverty line

Total Number of registered cars/light vehicles **13 854 701.00**

Average Reported road death / 100 000
21.10

WHO estimated total road deaths
30 622.00

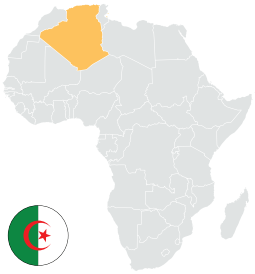
Average number of registered cars/light vehicles
157.10

Total CO2 Emissions (mtCO2)
531.67

Algeria

Table 10: Country Profile Algeria

NORTH AFRICA



CURRENT LAW: COMPLETE BAN

Sulphur limit in diesel (ppm)
501 - 2000

Sulphur limit in petrol (ppm)
51 - 150

Frontal impact protection	Unknown
ESC	Unknown
Pedestrian protection	Unknown
Roadworthiness test	No
Higher tariff based on engine capacity	No

Total Population ('000)
40 000.00

Economically active population ('000)
12 117.00

GNI per capita (US$) **14 310.00**

30.29%

Percentage of population economically active (%)

-

% below international poverty line

Deaths due to ambient air pollution/100 000 **987**

% of GDP spent on healthcare **6.65%**

Number of registered cars/light vehicles **-**

Reported road death / 100 000	WHO estimated total road deaths	Vehicles per 1000 population	CO2 Emissions (mtCO2)
-	-	-	150.55

Used vehicles imported **-**

Egypt

Table 11: Country Profile Egypt

NORTH AFRICA

CURRENT LAW: COMPLETE BAN

Sulphur limit in diesel (ppm)
2000 - 10000

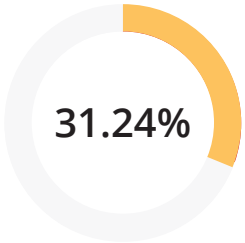
Sulphur limit in petrol (ppm)
151 - 500

Frontal impact protection	Yes
ESC	Yes
Pedestrian protection	Yes
Roadworthiness test	No
Higher tariff based on engine capacity	No

Total Population ('000)
91 000.00

Economically active population ('000)
28 431.00

GNI per capita (US$) **10 710.00**



Percentage of population economically active (%)

% below international poverty line

Deaths due to ambient air pollution/100 000 **2 162**

% of GDP spent on healthcare **4.64%**

Number of registered cars/light vehicles **4 966 129.00**

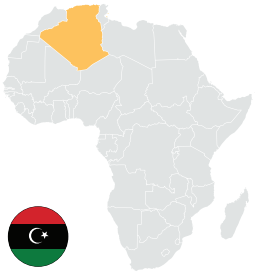
Reported road death / 100 000	WHO estimated total road deaths	Vehicles per 1000 population	CO2 Emissions (mtCO2)
9.70	**9 287.00**	**54.57**	**218.66**

Used vehicles imported (2013) **23**

Libya

Table 12: Country Profile Libya

NORTH AFRICA



CURRENT LAW: 5 YEAR AGE LIMIT

Sulphur limit in diesel (ppm)
501 - 2000

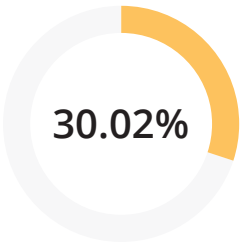
Sulphur limit in petrol (ppm)
51 - 150

Frontal impact protection	No
ESC	No
Pedestrian protection	No
Roadworthiness test	No
Higher tariff based on engine capacity	No

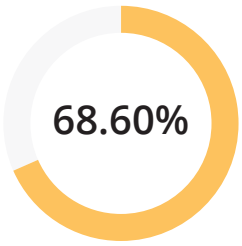
Total Population ('000)
6 200.00

Economically active population ('000)
1 861.00

GNI per capita (US$) **11 040.00**



Percentage of population economically active (%)



% below international poverty line

Deaths due to ambient air pollution/100 000 **1 222**

% of GDP spent on healthcare **6.05%**

Number of registered cars/light vehicles **2 821 285.00**

Reported road death / 100 000	WHO estimated total road deaths	Vehicles per 1000 population	CO2 Emissions (mtCO2)
26.10	**1 645.00**	**455.05**	**53.39**

Used vehicles imported (US Trade, 2018) **21 005**

Morocco

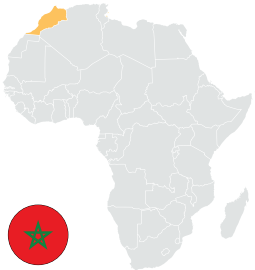


Table 13: Country Profile Morocco NORTH AFRICA

CURRENT LAW: COMPLETE BAN

Sulphur limit in diesel (ppm)
10 - 15

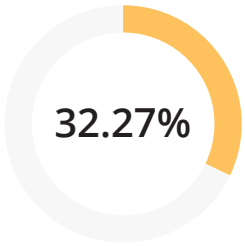
Sulphur limit in petrol (ppm)
31 - 50

Frontal impact protection	No
ESC	No
Pedestrian protection	No
Roadworthiness test	No
Higher tariff based on engine capacity	No

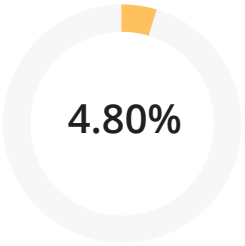
GNI per capita (US$) **7 690.00**

Total Population ('000)
34 486.00

Economically active population ('000)
11 128.10



Percentage of population economically active (%)



% below international poverty line

Deaths due to ambient air pollution/100 000 **892**

% of GDP spent on healthcare **5.84%**

Number of registered cars/light vehicles **3 413 980.00**

Reported road death / 100 000
19.60

WHO estimated total road deaths
6 917.00

Vehicles per 1000 population
99.00

CO2 Emissions (mtCO2)
62.73

Used vehicles imported (Total 2010-2014, AASA) **5 847**

Sudan

Table 14: Country Profile Sudan

NORTH AFRICA

CURRENT LAW: COMPLETE BAN

Sulphur limit in diesel (ppm)
80.00

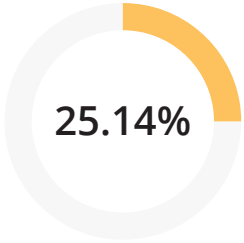
Sulphur limit in petrol (ppm)
30.00

Frontal impact protection	No
ESC	No
Pedestrian protection	No
Roadworthiness test	Yes
Higher tariff based on engine capacity	No

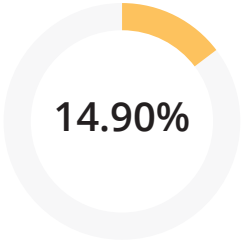
GNI per capita (US$) **3 990.00**

Total Population ('000)
39 600.00

Economically active population ('000)
9 953.80



Percentage of population economically active (%)



% below international poverty line

Deaths due to ambient air pollution/100 000 **2 374**

% of GDP spent on healthcare **5.66%**

Number of registered cars/light vehicles **935 132.00**

Reported road death / 100 000
25.70

WHO estimated total r oad deaths
10 178.00

Vehicles per 1000 population
23.61

CO2 Emissions (mtCO2)
18.21

Used vehicles imported (Total 2010-2014, AASA) **12 627**

Tunisia

Table 15: Country Profile Tunisia NORTH AFRICA

CURRENT LAW: 5 YEAR AGE LIMIT. ADDITIONAL TAX ADDED FOR EACH YEAR OLDER THAN 5

Sulphur limit in diesel (ppm)
2000 - 10000

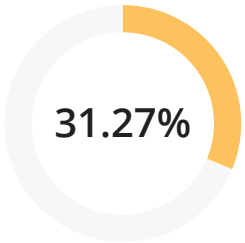
Sulphur limit in petrol (ppm)
0 - 10

Frontal impact protection	No
ESC	No
Pedestrian protection	No
Roadworthiness test	Yes
Higher tariff based on engine capacity	Yes

Total Population ('000)
11 200.00

Economically active population ('000)
3 502.60

GNI per capita (US$) **11 100.00**



Percentage of population economically active (%)

% below international poverty line

Deaths due to ambient air pollution/100 000 **1 312**

% of GDP spent on healthcare **6.95%**

Number of registered cars/light vehicles **1 718 175.00**

Reported road death / 100 000
24.40

WHO estimated total road deaths
2 595.00

Vehicles per 1000 population
153.41

CO2 Emissions (mtCO2)
28.13

Used vehicles imported (Total 2010-2014, AASA) **4 419**

Country Profiles

Table 16: Country Profiles East Africa

Average Gross national income (GNI)

5 261

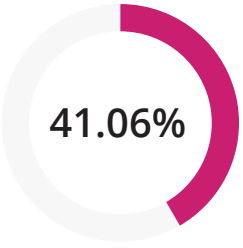
Total Population ('000)
304 421.3

Average Population per country ('000)
21 744.4

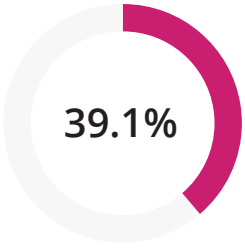
Total Economically active population ('000)
135 909.1

Average Economically active population ('000)
10 454.5

BURUNDI	ERITREA	MADAGASCAR	SEYCHELLES	TANZANIA
COMOROS	ETHIOPIA	MAURITIUS	SOMALIA	UGANDA
DJIBOUTI	KENYA	RWANDA	SOUTH SUDAN	



Average % of population economically active



Average % below international poverty line

Total Number of registered cars/light vehicles **1 293 139**

Average Reported road death / 100 000
26.5

WHO estimated total road deaths
92 570

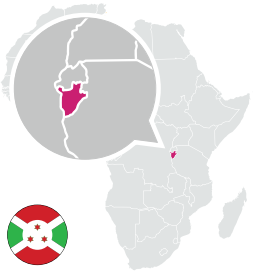
Average number of registered cars/light vehicles
143 682

Total CO2 Emissions (mtCO2)
63.24103

Burundi

Table 17: Country Profile Burundi

EAST AFRICA



CURRENT LAW: NO RESTRICTIONS

Sulphur limit in diesel (ppm)

-

Sulphur limit in petrol (ppm)

501 - 3500

Frontal impact protection	No
ESC	No
Pedestrian protection	No
Roadworthiness test	No
Higher tariff based on engine capacity	No

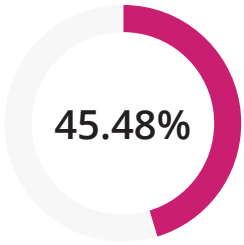
GNI per capita (US$) **730**

Total Population ('000)

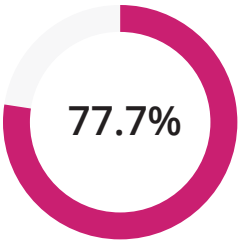
11 178.9

Economically active population ('000)

5 084.7



Percentage of population economically active (%)



% below international poverty line

Deaths due to ambient air pollution/100 000 **2 052**

% of GDP spent on healthcare **6.19%**

Number of registered cars/light vehicles **3 248**

Reported road death / 100 000	WHO estimated total road deaths	Vehicles per 1000 population	CO2 Emissions (mtCO2)
34.7	**3 651**	**0.3**	**0.52914**

Used vehicles imported (Total 2010-2014, AASA) **2 539**

Comoros

Table 18: Country Profile Comoros

EAST AFRICA

CURRENT LAW: UNKNOWN

Sulphur limit in diesel (ppm)

-

Sulphur limit in petrol (ppm)

-

Frontal impact protection	No
ESC	No
Pedestrian protection	No
Roadworthiness test	No
Higher tariff based on engine capacity	No

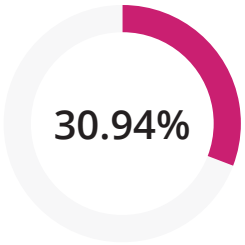
GNI per capita (US$) **1 490**

Total Population ('000)

788.5

Economically active population ('000)

244.0



Percentage of population economically active (%)

% below international poverty line

Deaths due to ambient air pollution/100 000 **1 378**

% of GDP spent on healthcare **7.63%**

Number of registered cars/light vehicles -

Reported road death / 100 000

26.5

WHO estimated total r oad deaths

211

Vehicles per 1000 population

-

CO2 Emissions (mtCO2)

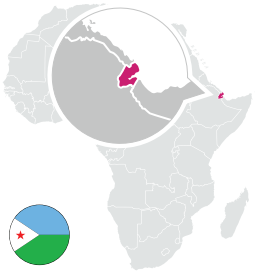
0.18948

Used vehicles imported (US$, 2014) **10 350**

Djibouti

Table 19: Country Profile Djibouti

EAST AFRICA



CURRENT LAW: NO RESTRICTIONS

Sulphur limit in diesel (ppm)

-

Sulphur limit in petrol (ppm)

501 - 3500

Frontal impact protection	Unknown
ESC	Unknown
Pedestrian protection	Unknown
Roadworthiness test	No
Higher tariff based on engine capacity	No

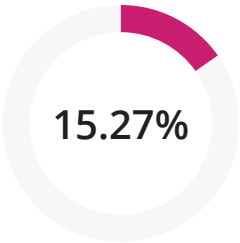
Total Population ('000)

942.8

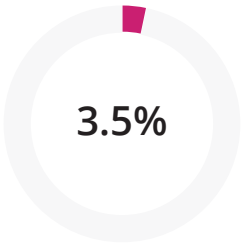
Economically active population ('000)

144.0

GNI per capita (US$) -



Percentage of population economically active (%)



% below international poverty line

Deaths due to ambient air pollution/100 000 **1 763**

% of GDP spent on healthcare **6.19%**

Number of registered cars/light vehicles -

Reported road death / 100 000

-

WHO estimated total road deaths

-

Vehicles per 1000 population

-

CO2 Emissions (mtCO2)

0.81701

Used vehicles imported **Unknown**

Eritrea

Table 20: Country Profile Eritrea

EAST AFRICA

CURRENT LAW: 10 YEAR AGE LIMIT

Sulphur limit in diesel (ppm)
3000

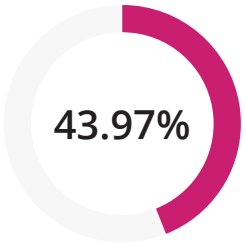
Sulphur limit in petrol (ppm)
1000

Frontal impact protection	No
ESC	No
Pedestrian protection	No
Roadworthiness test	No
Higher tariff based on engine capacity	No

GNI per capita (US$) **1 400**

Total Population ('000)
5 227.8

Economically active population ('000)
2 298.9



Percentage of population economically active (%)

% below international poverty line

Deaths due to ambient air pollution/100 000 **1 818**

% of GDP spent on healthcare **2.96%**

Number of registered cars/light vehicles **42 468**

Reported road death / 100 000
25.3

WHO estimated total road deaths
1 255

Vehicles per 1000 population
8.1

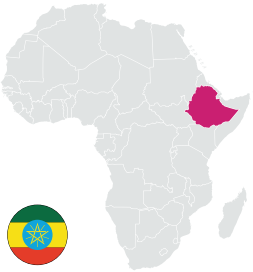
CO2 Emissions (mtCO2)
0.79305

Used vehicles imported (US$, 2014) **775 564**

Ethiopia

Table 21: Country Profile Ethiopia

EAST AFRICA



CURRENT LAW: NO RESTRICTIONS

Sulphur limit in diesel (ppm)
2000 - 10000

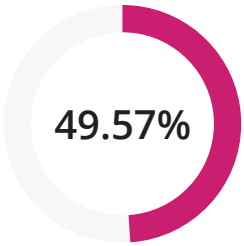
Sulphur limit in petrol (ppm)
501 - 3500

Frontal impact protection	No
ESC	No
Pedestrian protection	No
Roadworthiness test	Yes
Higher tariff based on engine capacity	No

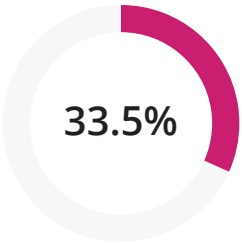
GNI per capita (US$) **1 620**

Total Population ('000)
92 099.9

Economically active population ('000)
45 654.1



Percentage of population economically active (%)



% below international poverty line

Deaths due to ambient air pollution/100 000 **1 461**

% of GDP spent on healthcare **3.97%**

Number of registered cars/light vehicles **-**

Reported road death / 100 000	WHO estimated total road deaths	Vehicles per 1000 population	CO2 Emissions (mtCO2)
26.7	**27 326**	**-**	**13.3962**

Used vehicles imported (US$, 2014) **1 035 284**

Kenya

Table 22: Country Profile Kenya

EAST AFRICA

CURRENT LAW: 8 YEAR AGE LIMIT, ADDITIONAL TAX ADDED FOR EACH YEAR OLDER THAN 3

Sulphur limit in diesel (ppm)
50

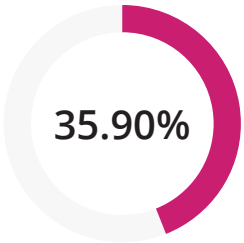
Sulphur limit in petrol (ppm)
150

Frontal impact protection	No
ESC	No
Pedestrian protection	No
Roadworthiness test	Yes
Higher tariff based on engine capacity	Yes

GNI per capita (US$) **3 070**

Total Population ('000)
45 389.1

Economically active population ('000)
16 294.0



Percentage of population economically active (%)

% below international poverty line

Deaths due to ambient air pollution/100 000 **743**

% of GDP spent on healthcare **4.55%**

Number of registered cars/light vehicles **13 463**

Reported road death / 100 000
27.8

WHO estimated total road deaths
13 463

Vehicles per 1000 population
-

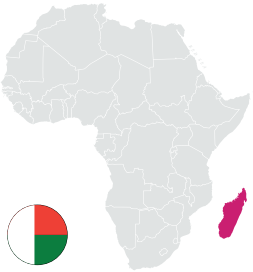
CO2 Emissions (mtCO2)
15.8182

Used vehicles imported (JEVIC; Eurostat; US ITA, 2017) **76 336**

Madagascar

Table 23: Country Profile Madagascar

EAST AFRICA



CURRENT LAW: NO RESTRICTIONS

Sulphur limit in diesel (ppm)
351 - 500

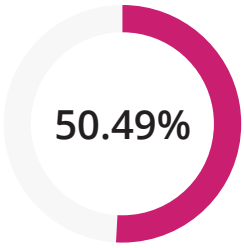
Sulphur limit in petrol (ppm)
501 - 3000

Frontal impact protection	No
ESC	No
Pedestrian protection	No
Roadworthiness test	No
Higher tariff based on engine capacity	No

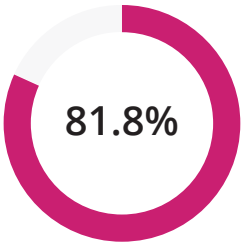
Total Population ('000)
23 658.0

Economically active population ('000)
11 946.0

GNI per capita (US$) **1 410**



Percentage of population economically active (%)



% below international poverty line

Deaths due to ambient air pollution/100 000 **1 099**

% of GDP spent on healthcare **3.97%**

Number of registered cars/light vehicles **136 508**

Reported road death / 100 000	WHO estimated total road deaths	Vehicles per 1000 population	CO2 Emissions (mtCO2)
28.6	**7 108**	**5.8**	**3.1821**

Used vehicles imported **Unknown**

Mauritius

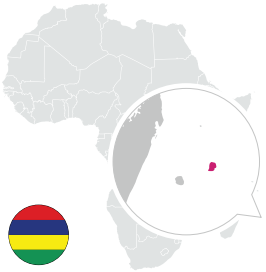


Table 24: Country Profile Mauritius

EAST AFRICA

CURRENT LAW: 3 YEAR AGE LIMIT. CO2 TAX

Sulphur limit in diesel (ppm)
50

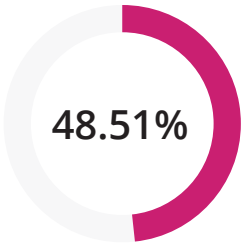
Sulphur limit in petrol (ppm)
150

Frontal impact protection	No
ESC	No
Pedestrian protection	No
Roadworthiness test	Yes
Higher tariff based on engine capacity	Yes

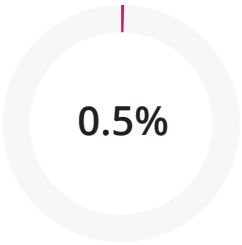
GNI per capita (US$) **19 940**

Total Population ('000)
1 263.5

Economically active population ('000)
612.9



Percentage of population economically active (%)



% below international poverty line

Deaths due to ambient air pollution/100 000 **976**

% of GDP spent on healthcare **5.75%**

Number of registered cars/light vehicles **282 855**

Reported road death / 100 000	WHO estimated total road deaths	Vehicles per 1000 population	CO2 Emissions (mtCO2)
13.7	173	223.9	4.2792

Used vehicles imported (US$, 2014) **48 249 991**

Rwanda

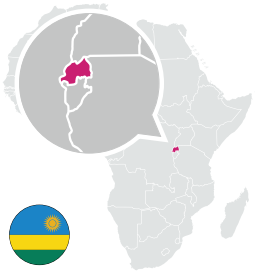


Table 25: Country Profile Rwanda

EAST AFRICA

CURRENT LAW: NO RESTRICTIONS. ADDITIONAL TAX FOR EACH YEAR OLDER THAN 10

Sulphur limit in diesel (ppm)
16 - 50

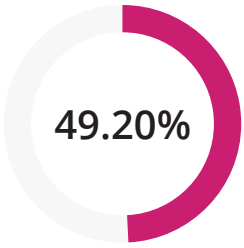
Sulphur limit in petrol (ppm)
51 - 150

Frontal impact protection	No
ESC	No
Pedestrian protection	No
Roadworthiness test	No
Higher tariff based on engine capacity	Yes

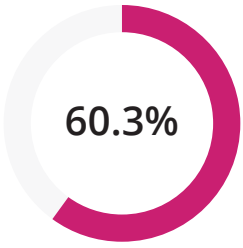
GNI per capita (US$) **1 720**

Total Population ('000)
11 533.4

Economically active population ('000)
5 674.4



Percentage of population economically active (%)



% below international poverty line

Deaths due to ambient air pollution/100 000 **997**

% of GDP spent on healthcare **6.76%**

Number of registered cars/light vehicles **71 394**

Reported road death / 100 000
29.7

WHO estimated total road deaths
3 535

Vehicles per 1000 population
6.2

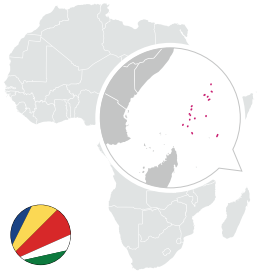
CO2 Emissions (mtCO2)
1.0247

Used vehicles imported (US$, 2014) **950 035**

Seychelles

Table 26: Country Profile Seychelles

EAST AFRICA



CURRENT LAW: 3 YEAR AGE LIMIT

Sulphur limit in diesel (ppm)
500 - 5000

Sulphur limit in petrol (ppm)
110

Frontal impact protection	No
ESC	No
Pedestrian protection	No
Roadworthiness test	No
Higher tariff based on engine capacity	No

GNI per capita (US$) **25 670**

Total Population ('000)
96.5

Economically active population ('000)
-

-

Percentage of population economically active (%)

0.4%

% below international poverty line

Deaths due to ambient air pollution/100 000 **1178**

% of GDP spent on healthcare **3.94%**

Number of registered cars/light vehicles **19 469**

Reported road death / 100 000	WHO estimated total road deaths	Vehicles per 1000 population	CO2 Emissions (mtCO2)
15.9	**15**	**201.8**	**0.60905**

Used vehicles imported (US$, 2014) **554 943**

Somalia

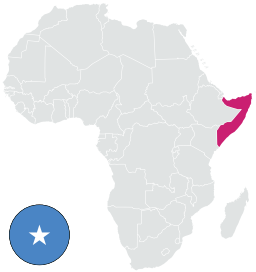


Table 27: Country Profile Somalia

EAST AFRICA

CURRENT LAW: NO RESTRICTIONS

Sulphur limit in diesel (ppm)

-

Sulphur limit in petrol (ppm)

-

Frontal impact protection	No
ESC	No
Pedestrian protection	No
Roadworthiness test	No
Higher tariff based on engine capacity	No

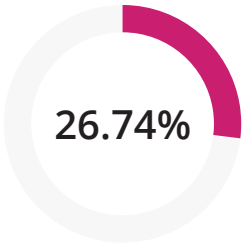
GNI per capita (US$) -

Total Population ('000)

10 787.1

Economically active population ('000)

2 884.3



Percentage of population economically active (%)

% below international poverty line

Deaths due to ambient air pollution/100 000 **3 653**

% of GDP spent on healthcare -

Number of registered cars/light vehicles **56 000**

Reported road death / 100 000	WHO estimated total road deaths	Vehicles per 1000 population	CO2 Emissions (mtCO2)
27.1	**3 884**	**5.2**	**0.7489**

Used vehicles imported **Unknown**

South Sudan

Table 28: Country Profile South Sudan

EAST AFRICA

CURRENT LAW: NO RESTRICTIONS

Sulphur limit in diesel (ppm)

-

Sulphur limit in petrol (ppm)

-

Frontal impact protection	No
ESC	No
Pedestrian protection	No
Roadworthiness test	No
Higher tariff based on engine capacity	No

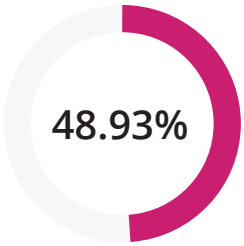
GNI per capita (US$) **1 630**

Total Population ('000)

11 425.4

Economically active population ('000)

5 590.2



Percentage of population economically active (%)

% below international poverty line

Deaths due to ambient air pollution/100 000 **2 537**

% of GDP spent on healthcare **-**

Number of registered cars/light vehicles **32 070**

Reported road death / 100 000	WHO estimated total road deaths	Vehicles per 1000 population	CO2 Emissions (mtCO2)
29.9	3 661	2.8	1.8407

Used vehicles imported (2013) **251**

Tanzania

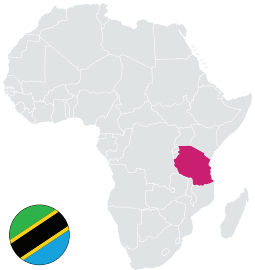


Table 29: Country Profile Tanzania EAST AFRICA

CURRENT LAW: NO RESTRICTIONS, ADDITIONAL TAX FOR EACH YEAR OLDER THAN 8

Sulphur limit in diesel (ppm)
16 - 50

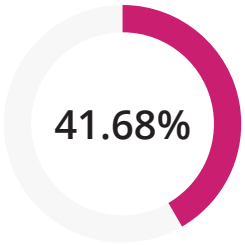
Sulphur limit in petrol (ppm)
51 - 150

Frontal impact protection	No
ESC	No
Pedestrian protection	No
Roadworthiness test	Yes
Higher tariff based on engine capacity	Yes

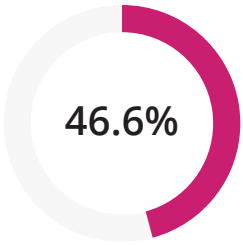
GNI per capita (US$) **2 630**

Total Population ('000)
53 470.4

Economically active population ('000)
22 284.4



Percentage of population economically active (%)



% below international poverty line

Deaths due to ambient air pollution/100 000 **1 239**

% of GDP spent on healthcare **4.14%**

Number of registered cars/light vehicles **16 252**

Reported road death / 100 000
29.2

WHO estimated total road deaths
16 252

Vehicles per 1000 population
-

CO2 Emissions (mtCO2)
14.2305

Used vehicles imported (Total 2010-2014, AASA) **89 430**

Uganda

Table 30: Country Profile Uganda

EAST AFRICA

CURRENT LAW: NO RESTRICTIONS, ADDITIONAL TAX FOR EACH YEAR OLDER THAN 5

Sulphur limit in diesel (ppm)
50

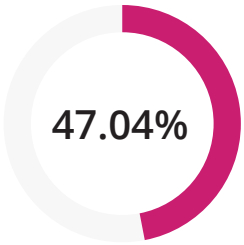
Sulphur limit in petrol (ppm)
150

Frontal impact protection	No
ESC	No
Pedestrian protection	No
Roadworthiness test	Yes
Higher tariff based on engine capacity	No

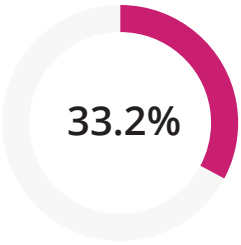
GNI per capita (US$) **1 820**

Total Population ('000)
36 560.0

Economically active population ('000)
17 197.2



Percentage of population economically active (%)



% below international poverty line

Deaths due to ambient air pollution/100 000 **1 768**

% of GDP spent on healthcare **6.17%**

Number of registered cars/light vehicles **649 127**

Reported road death / 100 000
29.0

WHO estimated total r oad deaths
12 036

Vehicles per 1000 population
17.8

CO2 Emissions (mtCO2)
5.7828

Used vehicles imported (Total 2010-2014, AASA) **78 474**

Country Profiles

Table 31: Country Profiles West Africa

Average Gross national income (GNI)

2 497

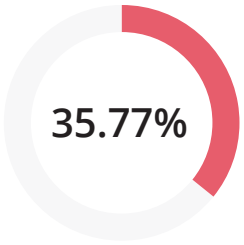
Total Population ('000)
357 168.4

Average Population per country ('000)
22 323.0

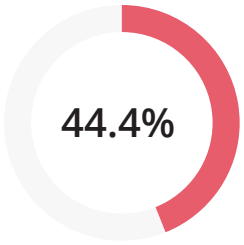
Total Economically active population ('000)
118 710.1

Average Economically active population ('000)
7 419.4

BENIN	GHANA	LIBERIA	NIGERIA
BURKINA FASO	GUINEA	MALI	SENEGAL
CAPE VERDE	GUINEA BISSAU	MAURITANIA	SIERRA LEONE
GAMBIA	IVORY COAST	NIGER	TOGO



Average % of population economically active



Average % below international poverty line

Total Number of registered cars/light vehicles **83 996**

Average Reported road death / 100 000
27.0

WHO estimated total road deaths
83 996

Average number of registered cars/light vehicles
1 177 828

Total CO2 Emissions (mtCO2)
159.0847

Benin

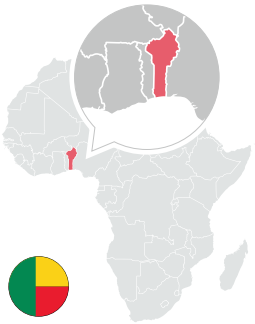


Table 32: Country Profile Benin

WEST AFRICA

CURRENT LAW: 10 YEAR AGE LIMIT

Sulphur limit in diesel (ppm)
3500

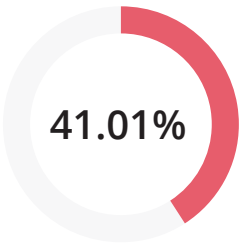
Sulphur limit in petrol (ppm)
3500

Frontal impact protection	No
ESC	No
Pedestrian protection	No
Roadworthiness test	Yes
Higher tariff based on engine capacity	Yes

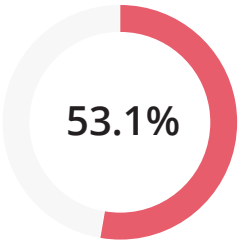
GNI per capita (US$) **2 050**

Total Population ('000)
10 879.8

Economically active population ('000)
4 461.5



Percentage of population economically active (%)



% below international poverty line

Deaths due to ambient air pollution/100 000 **2 365**

% of GDP spent on healthcare **3.86%**

Number of registered cars/light vehicles **238 436**

Reported road death / 100 000	WHO estimated total road deaths	Vehicles per 1000 population	CO2 Emissions (mtCO2)
27.5	**2 986**	**21.9**	**7.5021**

Used vehicles imported (JEVIC; Eurostat; US ITA, 2017) **46 004**

Burkina Faso

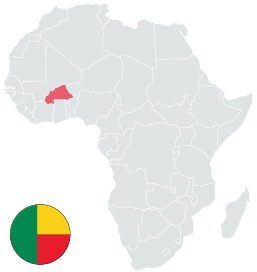


Table 33: Country Profile Burkina Faso WEST AFRICA

CURRENT LAW: NO RESTRICTIONS

Sulphur limit in diesel (ppm)
2000 - 10000

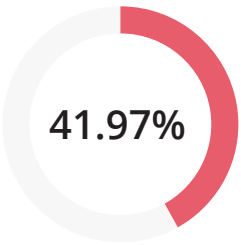
Sulphur limit in petrol (ppm)
501 - 3500

Frontal impact protection	No
ESC	No
Pedestrian protection	No
Roadworthiness test	Yes
Higher tariff based on engine capacity	No

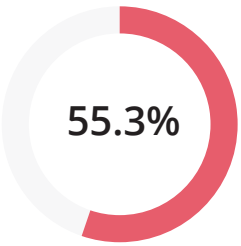
GNI per capita (US$) **1 660**

Total Population ('000)
19 034.4

Economically active population ('000)
7 988.5



Percentage of population economically active (%)



% below international poverty line

Deaths due to ambient air pollution/100 000 **1 915**

% of GDP spent on healthcare **6.75%**

Number of registered cars/light vehicles **237 979**

Reported road death / 100 000
30.5

WHO estimated total road deaths
5 686

Vehicles per 1000 population
12.5

CO2 Emissions (mtCO2)
3.335

Used vehicles imported (Total 2010-2014, AASA) **1 769**

Cape Verde

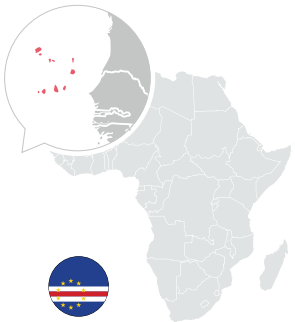


Table 34: Country Profile Cape Verde

WEST AFRICA

CURRENT LAW: NO RESTRICTIONS, FINE IMPOSED FOR EVERY YEAR OLDER THAN 4 YEARS

Sulphur limit in diesel (ppm)

-

Sulphur limit in petrol (ppm)

-

Frontal impact protection	No
ESC	No
Pedestrian protection	No
Roadworthiness test	No
Higher tariff based on engine capacity	No

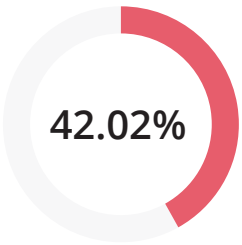
Total Population ('000)

531.2

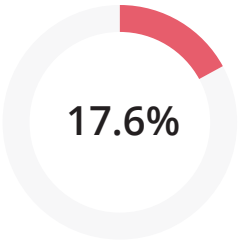
Economically active population ('000)

223.2

GNI per capita (US$) **6 320**



Percentage of population economically active (%)



% below international poverty line

Deaths due to ambient air pollution/100 000 **944**

% of GDP spent on healthcare **5.24%**

Number of registered cars/light vehicles -

Reported road death / 100 000

25.0

WHO estimated total road deaths

135

Vehicles per 1000 population

-

CO2 Emissions (mtCO2)

0.59998

Used vehicles imported (US$, 2014) **87 451**

Gambia

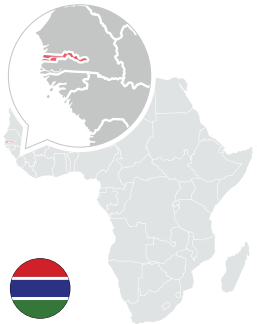


Table 35: Country Profile Gambia

WEST AFRICA

CURRENT LAW: NO RESTRICTIONS, ADDITIONAL TAX FOR EACH YEAR OLDER THAN 10

Sulphur limit in diesel (ppm)
5000

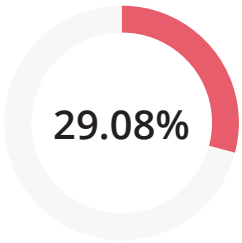
Sulphur limit in petrol (ppm)
501 - 3500

Frontal impact protection	No
ESC	No
Pedestrian protection	No
Roadworthiness test	Yes
Higher tariff based on engine capacity	Yes

GNI per capita (US$) **1 580**

Total Population ('000)
2 052.0

Economically active population ('000)
596.7



Percentage of population economically active (%)

% below international poverty line

Deaths due to ambient air pollution/100 000 **1 672**

% of GDP spent on healthcare **4.43%**

Number of registered cars/light vehicles **33 734**

Reported road death / 100 000	WHO estimated total road deaths	Vehicles per 1000 population	CO2 Emissions (mtCO2)
29.7	**605**	**16.4**	**0.62219**

Used vehicles imported (Total 2010-2014, AASA) **4.43**

Ghana

Table 36: Country Profile Ghana

WEST AFRICA

CURRENT LAW: FINE IMPOSED FOR EVERY YEAR OLDER THAN 5 YEARS

Sulphur limit in diesel (ppm)
3000

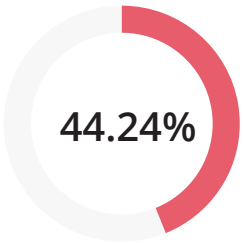
Sulphur limit in petrol (ppm)
1000

Frontal impact protection	No
ESC	No
Pedestrian protection	No
Roadworthiness test	Yes
Higher tariff based on engine capacity	Yes

GNI per capita (US$) **4 080**

Total Population ('000)
28 308.3

Economically active population ('000)
12 522.7



Percentage of population economically active (%)

% below international poverty line

Deaths due to ambient air pollution/100 000 **1 510**

% of GDP spent on healthcare **4.45%**

Number of registered cars/light vehicles **1 171 169**

Reported road death / 100 000
24.9

WHO estimated total road deaths
7 018

Vehicles per 1000 population
41.4

CO2 Emissions (mtCO2)
16.7648

Used vehicles imported (Total 2010-2014, AASA) **134 051**

Guinea

Table 37: Country Profile Guinea

WEST AFRICA

CURRENT LAW: 8 YEAR AGE LIMIT

Sulphur limit in diesel (ppm)

-

Sulphur limit in petrol (ppm)

-

Frontal impact protection	No
ESC	No
Pedestrian protection	No
Roadworthiness test	Yes
Higher tariff based on engine capacity	No

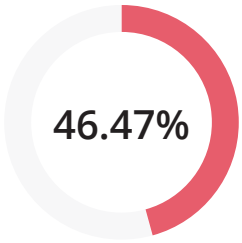
GNI per capita (US$) **1 120**

Total Population ('000)

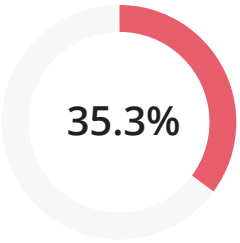
12 608.6

Economically active population ('000)

5 858.6



Percentage of population economically active (%)



% below international poverty line

Deaths due to ambient air pollution/100 000 **1 672**

% of GDP spent on healthcare **4.43%**

Number of registered cars/light vehicles **187 165**

Reported road death / 100 000	WHO estimated total road deaths	Vehicles per 1000 population	CO2 Emissions (mtCO2)
28.2	**3 490**	**14.8**	**2.9047**

Used vehicles imported (Total 2010-2014, AASA) **4.43**

Guinea Bissau

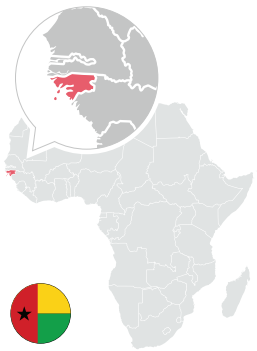


Table 38: Country Profile Guinea Bissau WEST AFRICA

CURRENT LAW: NO RESTRICTIONS

Sulphur limit in diesel (ppm)
-

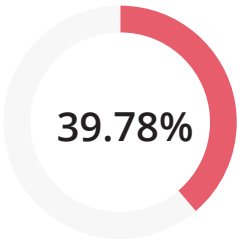
Sulphur limit in petrol (ppm)
-

Frontal impact protection	No
ESC	No
Pedestrian protection	No
Roadworthiness test	Yes
Higher tariff based on engine capacity	Yes

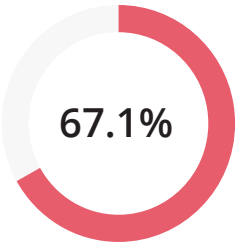
GNI per capita (US$) **1 450**

Total Population ('000)
1 844.3

Economically active population ('000)
733.7



Percentage of population economically active (%)



% below international poverty line

Deaths due to ambient air pollution/100 000 **1 870**

% of GDP spent on healthcare **6.09%**

Number of registered cars/light vehicles -

Reported road death / 100 000	WHO estimated total road deaths	Vehicles per 1000 population	CO2 Emissions (mtCO2)
31.1	565	-	0.33133

Used vehicles imported (Total 2010-2014, AASA) **103**

Ivory Coast

Table 39: Country Profile Ivory Coast WEST AFRICA

CURRENT LAW: FINE IMPOSED FOR EVERY YEAR OLDER THAN 10 YEARS

Sulphur limit in diesel (ppm)
3500

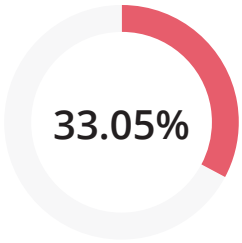
Sulphur limit in petrol (ppm)
150

Frontal impact protection	No
ESC	No
Pedestrian protection	No
Roadworthiness test	Yes
Higher tariff based on engine capacity	Yes

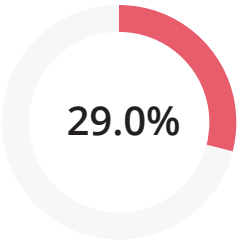
GNI per capita (US$) **3 260**

Total Population ('000)
23 950.0

Economically active population ('000)
7 914.7



Percentage of population economically active (%)



% below international poverty line

Deaths due to ambient air pollution/100 000 **2 551**

% of GDP spent on healthcare **4.4%**

Number of registered cars/light vehicles **624 820**

Reported road death / 100 000
23.6

WHO estimated total road deaths
5 582

Vehicles per 1000 population
26.1

CO2 Emissions (mtCO2)
11.7244

Used vehicles imported (2017) **69 552**

Liberia

Table 40: Country Profile Liberia WEST AFRICA

CURRENT LAW: 12 YEAR AGE LIMIT. ADDITIONAL TAX FOR EACH YEAR OLDER THAN 10

Sulphur limit in diesel (ppm)
-

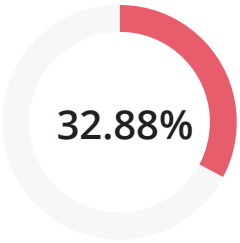
Sulphur limit in petrol (ppm)
-

Frontal impact protection	No
ESC	No
Pedestrian protection	No
Roadworthiness test	Yes
Higher tariff based on engine capacity	No

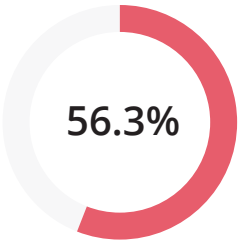
GNI per capita (US$) **720**

Total Population ('000)
4 615.0

Economically active population ('000)
1 517.4



Percentage of population economically active (%)



% below international poverty line

Deaths due to ambient air pollution/100 000 **1 029**

% of GDP spent on healthcare **9.62%**

Number of registered cars/light vehicles **1 073 438**

Reported road death / 100 000	WHO estimated total road deaths	Vehicles per 1000 population	CO2 Emissions (mtCO2)
35.9	**1 657**	**232.6**	**1.0778**

Used vehicles imported (Total 2010-2014, AASA) **15 516**

Mali

Table 41: Country Profile Mali WEST AFRICA

CURRENT LAW: NO RESTRICTIONS. ADDITIONAL TAX FOR EACH YEAR OLDER THAN 10

Sulphur limit in diesel (ppm)
2000 - 10000

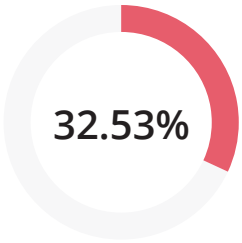
Sulphur limit in petrol (ppm)
151 - 500

Frontal impact protection	No
ESC	No
Pedestrian protection	No
Roadworthiness test	Yes
Higher tariff based on engine capacity	No

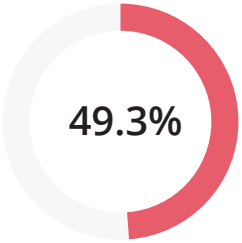
GNI per capita (US$) **1 970**

Total Population ('000)
18 300.0

Economically active population ('000)
5 953.0



Percentage of population economically active (%)



% below international poverty line

Deaths due to ambient air pollution/100 000 **2 202**

% of GDP spent on healthcare **3.82%**

Number of registered cars/light vehicles **197 660**

Reported road death / 100 000	WHO estimated total road deaths	Vehicles per 1000 population	CO2 Emissions (mtCO2)
23.1	**4 159**	**10.8**	**1.7238**

Used vehicles imported (Total 2010-2014, AASA) **19 297**

Mauritania

Table 42: Country Profile Mauritania

WEST AFRICA

CURRENT LAW: 8 YEAR AGE LIMIT

Sulphur limit in diesel (ppm)
2000 - 10000

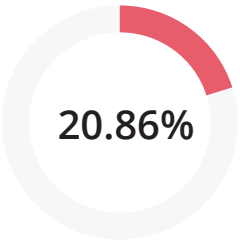
Sulphur limit in petrol (ppm)
501 - 3500

Frontal impact protection	No
ESC	No
Pedestrian protection	No
Roadworthiness test	Yes
Higher tariff based on engine capacity	No

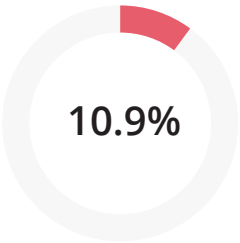
GNI per capita (US$) **3 710**

Total Population ('000)
3 805.7

Economically active population ('000)
793.8



Percentage of population economically active (%)



% below international poverty line

Deaths due to ambient air pollution/100 000 **2 001**

% of GDP spent on healthcare **4.24%**

Number of registered cars/light vehicles **-**

Reported road death / 100 000
24.7

WHO estimated total road deaths
1 064

Vehicles per 1000 population
-

CO2 Emissions (mtCO2)
2.8387

Used vehicles imported **Unknown**

Niger

Table 43: Country Profile Niger

WEST AFRICA

CURRENT LAW: NO AGE LIMIT FOR SACU. 5 YEAR AGE LIMIT FROM OUTSIDE

Sulphur limit in diesel (ppm)
380

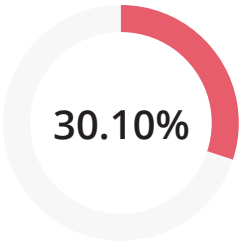
Sulphur limit in petrol (ppm)
160

Frontal impact protection	No
ESC	No
Pedestrian protection	No
Roadworthiness test	Yes
Higher tariff based on engine capacity	No

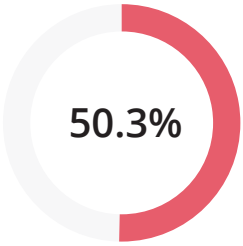
GNI per capita (US$) **950**

Total Population ('000)
19 865.1

Economically active population ('000)
5 979.1



Percentage of population economically active (%)



% below international poverty line

Deaths due to ambient air pollution/100 000 **4 072**

% of GDP spent on healthcare **6.23%**

Number of registered cars/light vehicles **231 740**

Reported road death / 100 000
26.2

WHO estimated total road deaths
5 414

Vehicles per 1000 population
11.7

CO2 Emissions (mtCO2)
2.4851

Used vehicles imported **Unknown**

Nigeria

Table 44: Country Profile Nigeria

WEST AFRICA

CURRENT LAW: 15 YEAR AGE LIMIT, EURO LEVEL 3

Sulphur limit in diesel (ppm)
2000 - 10000

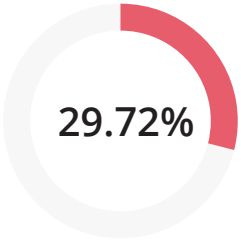
Sulphur limit in petrol (ppm)
501 - 3500

Total Population ('000)
182 202.0

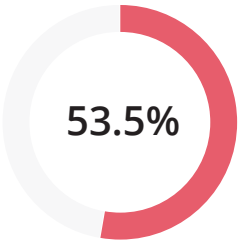
Economically active population ('000)
54 153.3

Frontal impact protection	No
ESC	No
Pedestrian protection	No
Roadworthiness test	No
Higher tariff based on engine capacity	No

GNI per capita (US$) **5 810**



Percentage of population economically active (%)



% below international poverty line

Deaths due to ambient air pollution/100 000 **4 045**

% of GDP spent on healthcare **3.65%**

Number of registered cars/light vehicles **6 732 639**

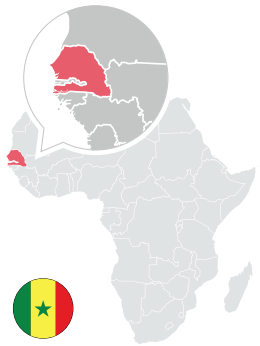
Reported road death / 100 000
21.4

WHO estimated total road deaths
39 802

Vehicles per 1000 population
37.0

CO2 Emissions (mtCO2)
107.3009

Used vehicles imported (2017) **142 629**



Senegal

Table 45: Country Profile Senegal

WEST AFRICA

CURRENT LAW: 8 YEAR AGE LIMIT

Sulphur limit in diesel (ppm)
2000 - 10000

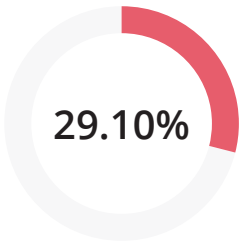
Sulphur limit in petrol (ppm)
501 - 3500

Frontal impact protection	No
ESC	No
Pedestrian protection	No
Roadworthiness test	Yes
Higher tariff based on engine capacity	No

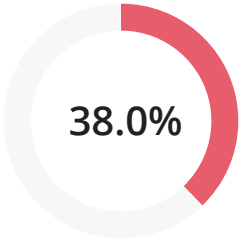
Total Population ('000)
15 129.3

Economically active population ('000)
4 402.9

GNI per capita (US$) **2 380**



Percentage of population economically active (%)



% below international poverty line

Deaths due to ambient air pollution/100 000 **1 388**

% of GDP spent on healthcare **5.51%**

Number of registered cars/light vehicles **348 088**

Reported road death / 100 000	WHO estimated total road deaths	Vehicles per 1000 population	CO2 Emissions (mtCO2)
23.4	**3 609**	**23.0**	**9.3185**

Used vehicles imported (2017) **56 380**

Sierra Leone

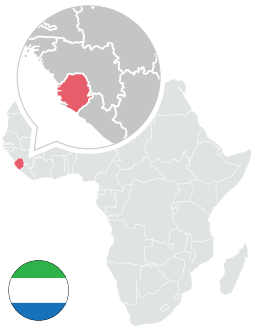


Table 46: Country Profile Sierra Leone WEST AFRICA

CURRENT LAW: NO RESTRICTIONS, ADDITIONAL TAX FOR EACH YEAR OLDER THAN 4

Sulphur limit in diesel (ppm)
2000 - 10000

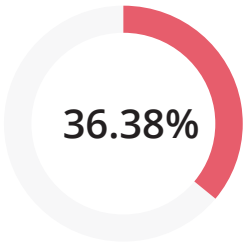
Sulphur limit in petrol (ppm)
151 - 500

Frontal impact protection	No
ESC	No
Pedestrian protection	No
Roadworthiness test	No
Higher tariff based on engine capacity	No

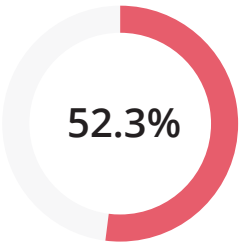
Total Population ('000)
6 592.0

Economically active population ('000)
2 398.4

GNI per capita (US$) **1 560**



Percentage of population economically active (%)



% below international poverty line

Deaths due to ambient air pollution/100 000 **2 162**

% of GDP spent on healthcare **16.53%**

Number of registered cars/light vehicles **-**

Reported road death / 100 000	WHO estimated total road deaths	Vehicles per 1000 population	CO2 Emissions (mtCO2)
-	-	-	1.3925

Used vehicles imported (Total 2010-2014, AASA) **11 042**

Togo

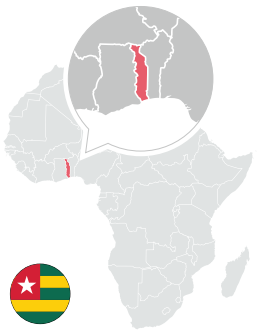


Table 47: Country Profile Togo WEST AFRICA

CURRENT LAW: NO RESTRICTIONS

Sulphur limit in diesel (ppm)
2000 - 10000

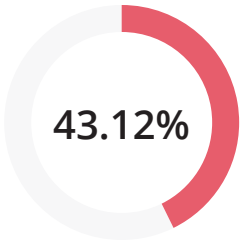
Sulphur limit in petrol (ppm)
501 - 3500

Frontal impact protection	No
ESC	No
Pedestrian protection	No
Roadworthiness test	Yes
Higher tariff based on engine capacity	Yes

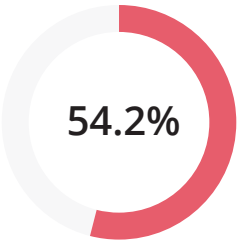
GNI per capita (US$) **1 330**

Total Population ('000)
7 450.7

Economically active population ('000)
3 212.6



Percentage of population economically active (%)



% below international poverty line

Deaths due to ambient air pollution/100 000 **2 013**

% of GDP spent on healthcare **6.62%**

Number of registered cars/light vehicles **17 000**

Reported road death / 100 000	WHO estimated total road deaths	Vehicles per 1000 population	CO2 Emissions (mtCO2)
29.2	**2 224**	**2.3**	**2.9911**

Used vehicles imported (2017) **49 391**

Country Profiles

Table 48: Country Profiles Central Africa

Average Gross national income (GNI)

7 771

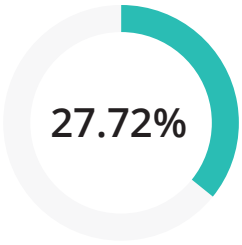
Total Population ('000)
126 119.5

Average Population per country ('000)
15 764.9

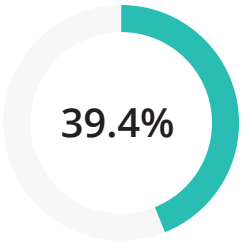
Total Economically active population ('000)
42 677.2

Average Economically active population ('000)
5 334.7

CAMEROON
CENTRAL AFRICAN REPUBLIC
CHAD
DEMOCRATIC REPUBLIC OF THE CONGO
EQUATORIAL GUINEA
GABON
REPUBLIC OF THE CONGO
SAO TOME AND PRINCIPE



Average % of population economically active



Average % below international poverty line

Total Number of registered cars/light vehicles -

Average Reported road death / 100 000
28.0

WHO estimated total road deaths
45 528

Average number of registered cars/light vehicles
-

Total CO2 Emissions (mtCO2)
29.30881

Cameroon

Table 49: Country Profile Cameroon

CENTRAL AFRICA

CURRENT LAW: 7 YEAR AGE LIMIT

Sulphur limit in diesel (ppm)
2000 - 10000

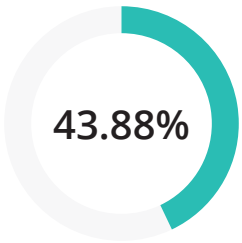
Sulphur limit in petrol (ppm)
151 - 500

Frontal impact protection	No
ESC	No
Pedestrian protection	No
Roadworthiness test	Yes
Higher tariff based on engine capacity	Yes

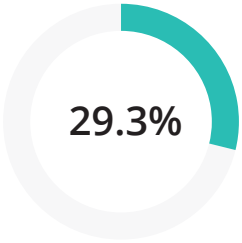
GNI per capita (US$) **3 070**

Total Population ('000)
22 179.7

Economically active population ('000)
9 732.8



Percentage of population economically active (%)



% below international poverty line

Deaths due to ambient air pollution/100 000 **3 007**

% of GDP spent on healthcare **4.69%**

Number of registered cars/light vehicles **47 354**

Reported road death / 100 000	WHO estimated total road deaths	Vehicles per 1000 population	CO2 Emissions (mtCO2)
30.1	**7 066**	**2.1**	**7.6872**

Used vehicles imported (2013) **108**

Central African Republic

Table 50: Country Profile Central African Republic

CENTRAL AFRICA

CURRENT LAW: NO RESTRICTIONS

Sulphur limit in diesel (ppm)

-

Sulphur limit in petrol (ppm)

-

Frontal impact protection	No
ESC	No
Pedestrian protection	No
Roadworthiness test	No
Higher tariff based on engine capacity	No

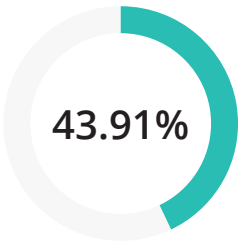
GNI per capita (US$) **620**

Total Population ('000)

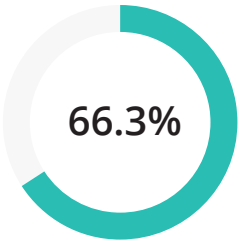
4 900.3

Economically active population ('000)

2 151.9



Percentage of population economically active (%)



% below international poverty line

Deaths due to ambient air pollution/100 000 **3 275**

% of GDP spent on healthcare **4.28%**

Number of registered cars/light vehicles -

Reported road death / 100 000

33.6

WHO estimated total road deaths

1 546

Vehicles per 1000 population

-

CO2 Emissions (mtCO2)

0.31073

Used vehicles imported (Total 2010-2014, AASA) **285**

Chad

Table 51: Country Profile Chad

CENTRAL AFRICA

CURRENT LAW: 3 YEAR AGE LIMIT

Sulphur limit in diesel (ppm)
166

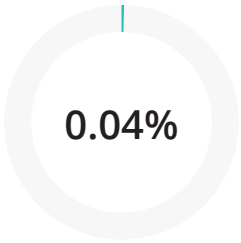
Sulphur limit in petrol (ppm)
35

Frontal impact protection	No
ESC	No
Pedestrian protection	No
Roadworthiness test	Yes
Higher tariff based on engine capacity	No

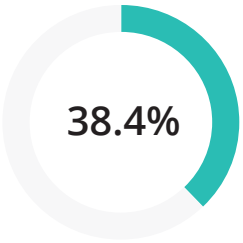
GNI per capita (US$) **2 110**

Total Population ('000)
14 400.0

Economically active population ('000)
5.2



Percentage of population economically active (%)



% below international poverty line

Deaths due to ambient air pollution/100 000 **5 303**

% of GDP spent on healthcare **4.54%**

Number of registered cars/light vehicles **-**

Reported road death / 100 000
27.6

WHO estimated total road deaths
3 990

Vehicles per 1000 population
-

CO2 Emissions (mtCO2)
0.72871

Used vehicles imported **Unknown**

Democratic Republic of the Congo

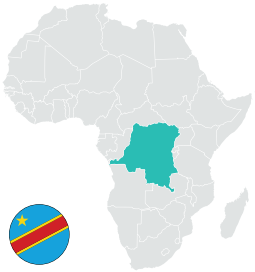


Table 52: Country Profile Democratic Republic of the Congo

CENTRAL AFRICA

CURRENT LAW: 10 YEAR AGE LIMIT

Sulphur limit in diesel (ppm)
2000 - 10000

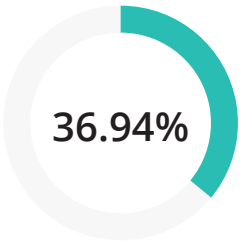
Sulphur limit in petrol (ppm)
501 - 3500

Frontal impact protection	No
ESC	No
Pedestrian protection	No
Roadworthiness test	Yes
Higher tariff based on engine capacity	No

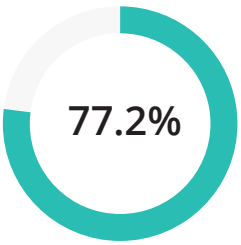
GNI per capita (US$) **720**

Total Population ('000)
77 266.8

Economically active population ('000)
28 542.3



Percentage of population economically active (%)



% below international poverty line

Deaths due to ambient air pollution/100 000 **2 254**

% of GDP spent on healthcare **3.87%**

Number of registered cars/light vehicles **-**

Reported road death / 100 000	WHO estimated total road deaths	Vehicles per 1000 population	CO2 Emissions (mtCO2)
33.7	**26 529**	**-**	**4.8137**

Used vehicles imported (2013) **1 763**

Equatorial Guinea

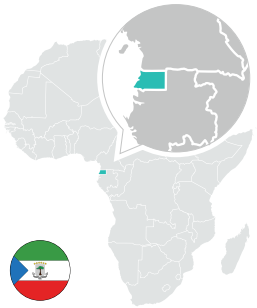


Table 53: Country Profile Equatorial Guinea

CENTRAL AFRICA

CURRENT LAW: NO RESTRICTIONS

Sulphur limit in diesel (ppm)

-

Sulphur limit in petrol (ppm)

-

Frontal impact protection	No
ESC	No
Pedestrian protection	No
Roadworthiness test	No
Higher tariff based on engine capacity	No

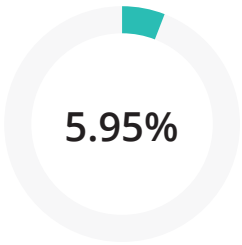
GNI per capita (US$) **27 200**

Total Population ('000)

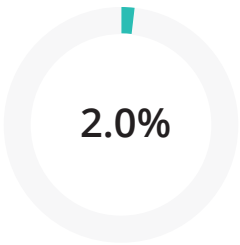
845.1

Economically active population ('000)

50.3



Percentage of population economically active (%)



% below international poverty line

Deaths due to ambient air pollution/100 000 **2 594**

% of GDP spent on healthcare **3.38%**

Number of registered cars/light vehicles -

Reported road death / 100 000	WHO estimated total road deaths	Vehicles per 1000 population	CO2 Emissions (mtCO2)
24.6	**300**	**-**	**6.7149**

Used vehicles imported **Unknown**

Gabon

Table 54: Country Profile Gabon

CENTRAL AFRICA

CURRENT LAW: 4 YEAR AGE LIMIT

Sulphur limit in diesel (ppm)
1500

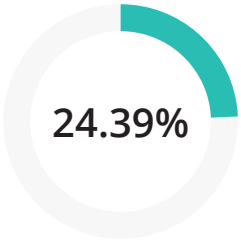
Sulphur limit in petrol (ppm)
150

Frontal impact protection	No
ESC	No
Pedestrian protection	No
Roadworthiness test	Yes
Higher tariff based on engine capacity	No

GNI per capita (US$) **18 880**

Total Population ('000)
1 725.3

Economically active population ('000)
420.8



Percentage of population economically active (%)

% below international poverty line

Deaths due to ambient air pollution/100 000 **1 231**

% of GDP spent on healthcare **3.11%**

Number of registered cars/light vehicles **-**

Reported road death / 100 000
23.2

WHO estimated total road deaths
460

Vehicles per 1000 population
-

CO2 Emissions (mtCO2)
5.5264

Used vehicles imported **Unknown**

Republic of the Congo

Table 55: Country Profile Republic of the Congo

CENTRAL AFRICA

CURRENT LAW: 7 YEAR AGE LIMIT

Sulphur limit in diesel (ppm)
2000 - 10000

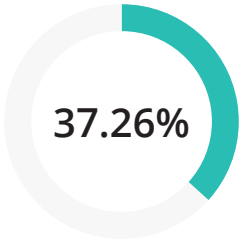
Sulphur limit in petrol (ppm)
151 - 500

Frontal impact protection	No
ESC	No
Pedestrian protection	No
Roadworthiness test	No
Higher tariff based on engine capacity	No

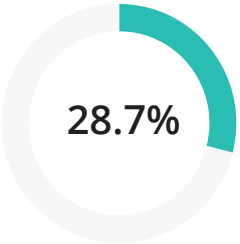
GNI per capita (US$) **6 320**

Total Population ('000)
4 608.6

Economically active population ('000)
1 717.0



Percentage of population economically active (%)



% below international poverty line

Deaths due to ambient air pollution/100 000 **1 404**

% of GDP spent on healthcare **4.63%**

Number of registered cars/light vehicles **-**

Reported road death / 100 000
23.6

WHO estimated total road deaths
5 582

Vehicles per 1000 population
-

CO2 Emissions (mtCO2)
3.4097

Used vehicles imported (Total 2010-2014, AASA) **28 502**

Sao Tome and Principe

Table 56: Country Profile Sao Tome and Principe

CENTRAL AFRICA

CURRENT LAW: UNKNOWN

Sulphur limit in diesel (ppm)
-

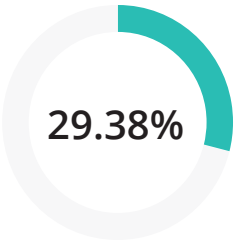
Sulphur limit in petrol (ppm)
-

Frontal impact protection	No
ESC	No
Pedestrian protection	No
Roadworthiness test	No
Higher tariff based on engine capacity	No

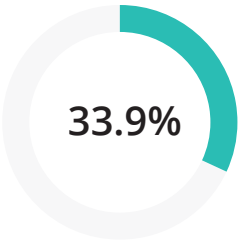
GNI per capita (US$) **3 250**

Total Population ('000)
193.7

Economically active population ('000)
56.9



Percentage of population economically active (%)



% below international poverty line

Deaths due to ambient air pollution/100 000 **986**

% of GDP spent on healthcare **5.99%**

Number of registered cars/light vehicles -

Reported road death / 100 000
27.5

WHO estimated total road deaths
55

Vehicles per 1000 population
-

CO2 Emissions (mtCO2)
0.11747

Used vehicles imported (US$, 2014) **17 567**

Country Profiles

Table 57: Country Profiles Southern Africa

Average Gross national income (GNI)

6 444

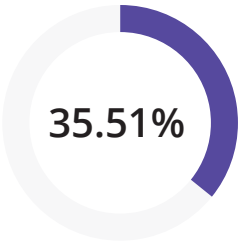
Total Population ('000)
162 519.4

Average Population per country ('000)
16 251.9

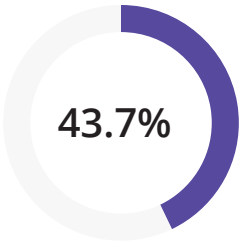
Total Economically active population ('000)
66 439.3

Average Economically active population ('000)
6 643.9

ANGOLA	LESOTHO	NAMIBIA	ZIMBABWE
BOTSWANA	MALAWI	SOUTH AFRICA	
ESWATINE (SWAZILAND)	MOZAMBIQUE	ZAMBIA	



Average % of population economically active



Average % below international poverty line

Total Number of registered cars/light vehicles **1 707 519**

Average Reported road death / 100 000	WHO estimated total road deaths	Average number of registered cars/light vehicles	Total CO2 Emissions (mtCO2)
28.4	**43 459**	**569 173**	**534.6087**

Angola

Table 58: Country Profile Angola

SOUTHERN AFRICA

CURRENT LAW: 3 YEAR AGE LIMIT, ONLY FOR PERSONAL USE

Sulphur limit in diesel (ppm)
501 - 2000

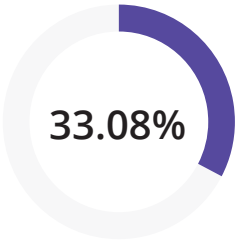
Sulphur limit in petrol (ppm)
151 - 500

Frontal impact protection	No
ESC	No
Pedestrian protection	No
Roadworthiness test	No
Higher tariff based on engine capacity	Yes

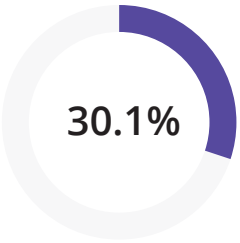
GNI per capita (US$) **6 470**

Total Population ('000)
25 022.0

Economically active population ('000)
8 276.9



Percentage of population economically active (%)



% below international poverty line

Deaths due to ambient air pollution/100 000 **1 758**

% of GDP spent on healthcare **2.88%**

Number of registered cars/light vehicles **-**

Reported road death / 100 000
23.6

WHO estimated total road deaths
6 797

Vehicles per 1000 population
-

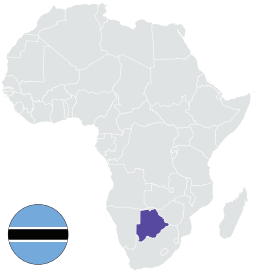
CO2 Emissions (mtCO2)
35.3899

Used vehicles imported (2017) **46 004**

Botswana

Table 59: Country Profile Botswana

SOUTHERN AFRICA



CURRENT LAW: MAX 100 000KM

Sulphur limit in diesel (ppm)
500

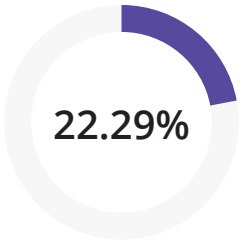
Sulphur limit in petrol (ppm)
500

Frontal impact protection	No
ESC	No
Pedestrian protection	No
Roadworthiness test	No
Higher tariff based on engine capacity	No

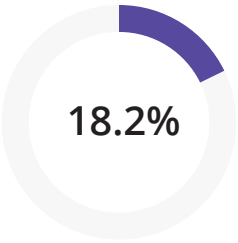
GNI per capita (US$) **15 510**

Total Population ('000)
2 200.0

Economically active population ('000)
490.3



Percentage of population economically active (%)



% below international poverty line

Deaths due to ambient air pollution/100 000 **841**

% of GDP spent on healthcare **5.46%**

Number of registered cars/light vehicles **438 224**

Reported road death / 100 000	WHO estimated total road deaths	Vehicles per 1000 population	CO2 Emissions (mtCO2)
23.8	**535**	**199.2**	**7.875**

Used vehicles imported (Total 2010-2014, AASA) **21 354**

Eswatini (Swaziland)

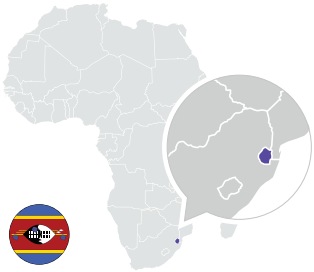


Table 60: Country Profile Swaziland

SOUTHERN AFRICA

CURRENT LAW: 15 YEAR AGE LIMIT

Sulphur limit in diesel (ppm)
351 - 500

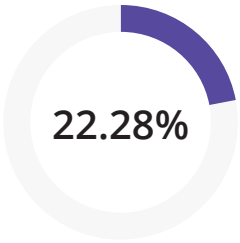
Sulphur limit in petrol (ppm)
501 - 3500

Frontal impact protection	No
ESC	No
Pedestrian protection	No
Roadworthiness test	No
Higher tariff based on engine capacity	No

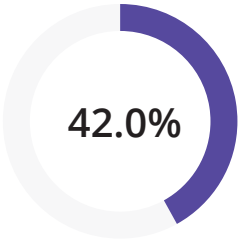
Total Population ('000)
1 300.0

Economically active population ('000)
289.6

GNI per capita (US$) **8 260**



Percentage of population economically active (%)



% below international poverty line

Deaths due to ambient air pollution/100 000 **1 077**

% of GDP spent on healthcare **7.7%**

Number of registered cars/light vehicles **-**

Reported road death / 100 000
26.9

WHO estimated total road deaths
361

Vehicles per 1000 population
-

CO2 Emissions (mtCO2)
1.3438

Used vehicles imported (Total 2010-2014, AASA) **2 863**

Lesotho

Table 61: Country Profile Lesotho

SOUTHERN AFRICA

CURRENT LAW: 8 YEAR AGE LIMIT

Sulphur limit in diesel (ppm)
500

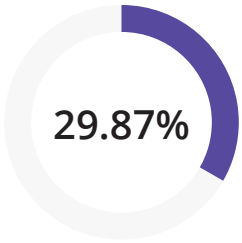
Sulphur limit in petrol (ppm)
500

Frontal impact protection	No
ESC	No
Pedestrian protection	No
Roadworthiness test	No
Higher tariff based on engine capacity	No

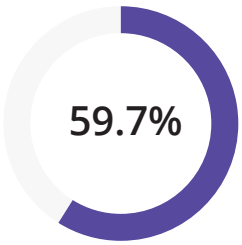
GNI per capita (US$) **3 290**

Total Population ('000)
2 200.0

Economically active population ('000)
657.1



Percentage of population economically active (%)



% below international poverty line

Deaths due to ambient air pollution/100 000 **1 843**

% of GDP spent on healthcare **8.08%**

Number of registered cars/light vehicles **-**

Reported road death / 100 000	WHO estimated total road deaths	Vehicles per 1000 population	CO2 Emissions (mtCO2)
28.9	**638**	**-**	**2.8238**

Used vehicles imported (2013) **901**

Malawi

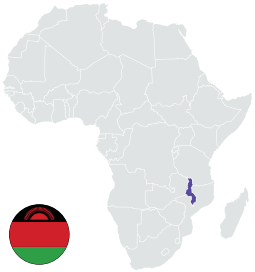


Table 62: Country Profile Malawi SOUTHERN AFRICA

CURRENT LAW: NO RESTRICTIONS, ADDITIONAL TAX FOR EACH YEAR OLDER THAN 9

Sulphur limit in diesel (ppm)
16 - 50

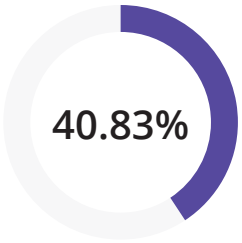
Sulphur limit in petrol (ppm)
31 - 50

Frontal impact protection	No
ESC	No
Pedestrian protection	No
Roadworthiness test	No
Higher tariff based on engine capacity	Yes

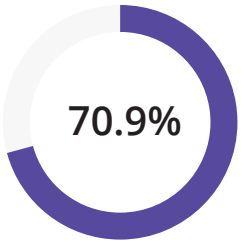
Total Population ('000)
16 832.9

Economically active population ('000)
6 873.4

GNI per capita (US$) **1 140**



Percentage of population economically active (%)



% below international poverty line

Deaths due to ambient air pollution/100 000 **771**

% of GDP spent on healthcare **9.83%**

Number of registered cars/light vehicles **-**

Reported road death / 100 000
31.0

WHO estimated total road deaths
5 601

Vehicles per 1000 population
-

CO2 Emissions (mtCO2)
1.3675

Used vehicles imported (Total 2010-2014, AASA) **7 308**

Namibia

Table 63: Country Profile Namibia

SOUTHERN AFRICA

CURRENT LAW: 8 YEAR AGE LIMIT

Sulphur limit in diesel (ppm)
351 - 500

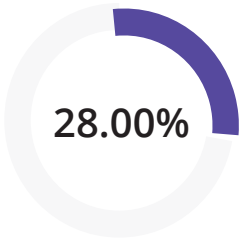
Sulphur limit in petrol (ppm)
501 - 3500

Frontal impact protection	No
ESC	No
Pedestrian protection	No
Roadworthiness test	No
Higher tariff based on engine capacity	No

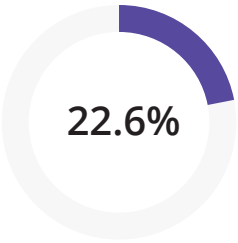
GNI per capita (US$) **10 380**

Total Population ('000)
2 458.8

Economically active population ('000)
688.4



Percentage of population economically active (%)



% below international poverty line

Deaths due to ambient air pollution/100 000 **1 112**

% of GDP spent on healthcare **9.12%**

Number of registered cars/light vehicles **315 443**

Reported road death / 100 000	WHO estimated total road deaths	Vehicles per 1000 population	CO2 Emissions (mtCO2)
30.4	**754**	**128.3**	**4.0653**

Used vehicles imported (Total 2010-2014, AASA) **9 582**

South Africa

Table 64: Country Profile South Africa

SOUTHERN AFRICA

CURRENT LAW: COMPLETE BAN

Sulphur limit in diesel (ppm)
500

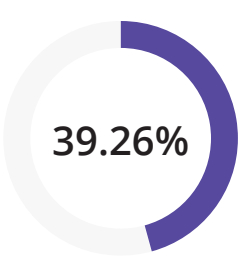
Sulphur limit in petrol (ppm)
500

Frontal impact protection	No
ESC	No
Pedestrian protection	No
Roadworthiness test	Yes
Higher tariff based on engine capacity	No

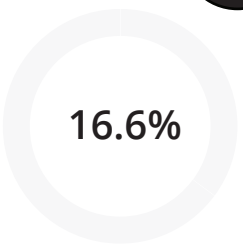
GNI per capita (US$) **12 870**

Total Population ('000)
55 653.7

Economically active population ('000)
21 849.0



Percentage of population economically active (%)



% below international poverty line

Deaths due to ambient air pollution/100 000 **1321**

% of GDP spent on healthcare **8.11%**

Number of registered cars/light vehicles **-**

Reported road death / 100 000
25.9

WHO estimated total road deaths
14 507

Vehicles per 1000 population
-

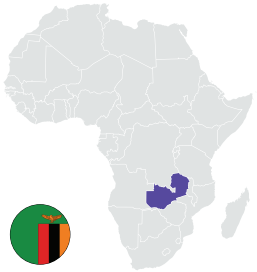
CO2 Emissions (mtCO2)
456.3252

Used vehicles imported (2017) **62 667**

Zambia

Table 65: Country Profile Zambia

SOUTHERN AFRICA



CURRENT LAW: NO RESTRICTIONS

Sulphur limit in diesel (ppm)
2000 - 10000

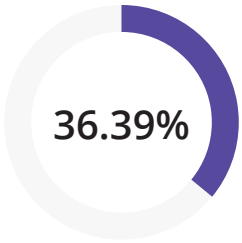
Sulphur limit in petrol (ppm)
501 - 500

Frontal impact protection	No
ESC	No
Pedestrian protection	No
Roadworthiness test	Yes
Higher tariff based on engine capacity	Yes

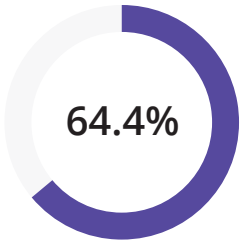
GNI per capita (US$) **3 640**

Total Population ('000)
16 211.8

Economically active population ('000)
5 899.1



Percentage of population economically active (%)



% below international poverty line

Deaths due to ambient air pollution/100 000 **1 156**

% of GDP spent on healthcare **4.48%**

Number of registered cars/light vehicles **-**

Reported road death / 100 000	WHO estimated total road deaths	Vehicles per 1000 population	CO2 Emissions (mtCO2)
-	-	-	4.7461

Used vehicles imported (Total 2010-2014, AASA) **48 349**

Zimbabwe

Table 66: Country Profile Zimbabwe

SOUTHERN AFRICA

CURRENT LAW: NO RESTRICTIONS, ADDITIONAL TAX FOR EACH YEAR OLDER THAN 5

Sulphur limit in diesel (ppm)
351 - 500

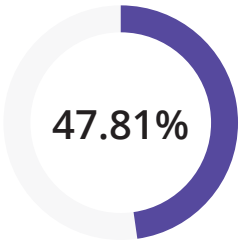
Sulphur limit in petrol (ppm)
151 - 500

Frontal impact protection	No
ESC	No
Pedestrian protection	No
Roadworthiness test	Yes
Higher tariff based on engine capacity	Yes

Total Population ('000)
14 240.2

Economically active population ('000)
6 808.7

GNI per capita (US$) **1 710**



Percentage of population economically active (%)

% below international poverty line

Deaths due to ambient air pollution/100 000 **984**

% of GDP spent on healthcare **9.41%**

Number of registered cars/light vehicles **953 852**

Reported road death / 100 000	WHO estimated total road deaths	Vehicles per 1000 population	CO2 Emissions (mtCO2)
34.7	**5 601**	**67.0**	**10.3977**

Used vehicles imported (Total 2010-2014, AASA) **13 803**

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