KEPSA
KENYA PRIVATE SECTOR ALLIANCE
The Voice of the Private Sector in Kenya

Climate Change and the Transport Sector


Photo credit: KEPSA

The transport sector is an important and necessary enabler of business, encompassing road, rail, air and maritime transport. It underlies virtually all other sectors and relies on extensive infrastructure. **Transport infrastructure is vulnerable to the impacts of climate, including heavy rains and sea level rise. At the same time, the transport sector is a significant and growing contributor of greenhouse gas emissions that lead to climate change.** An efficient, effective and climate-resilient transport sector is crucial to lower the overall cost of doing business and to increase competitiveness.

The transport sector in Kenya accounts for about 10 per cent of GDP and is rapidly growing.[1] Kenya's transport sector is dominated by road transport. The total vehicle population (excluding motorcycles) is estimated to have doubled from 600,000 vehicles in 2000 to 1,200,000 vehicles in 2010.[2]

Public transport is relatively under-developed and is dominated by minibuses (*matatus*). The vast majority of freight transport, including transit freight headed to other countries, is served by trucks. At the same time, increasing urbanization and the growth of major cities have put pressure on urban transport systems and infrastructure. In Nairobi and other major cities, severe traffic congestion, especially during the extended peak hours, contributes to local air pollution and leads to significant economic losses in time and fuel.[3] The sector has seen significant enhancements to improve the movement of people and goods, including the building of the Nairobi-Thika superhighway, the modernizing of the Mombasa-Nairobi highway, upgrading of the port of Mombasa, and plans to upgrade the railway track between Mombasa and the western border, through Nairobi.

Well functioning transportation infrastructure increases the efficiency and reduces the costs of moving goods and people. A competitive economy requires that goods reach domestic and export markets in a timely manner, meaning that the efficiency and quality of transport infrastructure and services are important contributors to Kenya's competitiveness. While the private sector relies on publically funded transport infrastructure - such as roads, ports and bridges - it is also a main stakeholder in the sector. The public transport system (*matatus* and buses) and the trucking industry are mostly owned by the private sector in Kenya.

Addressing climate change in the transport sector means working to reduce greenhouse gas emissions while encouraging development of transport infrastructure that accounts for flooding, extreme weather events and other effects of climate change.

How Climate Change Impacts the Transportation Sector

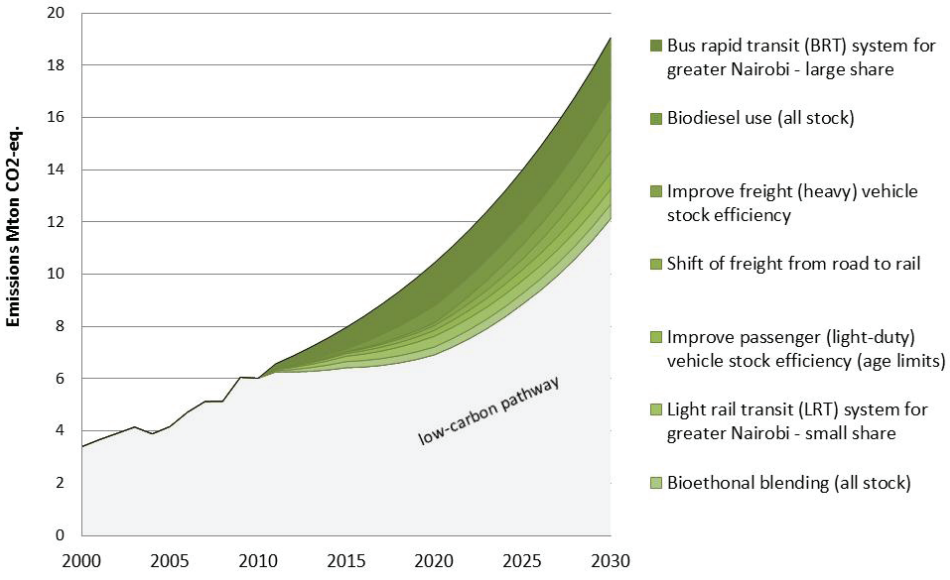
Businesses in the transport sector will need to adapt to the impacts of climate change. Sea level rise, storms, rain, flooding and higher temperatures pose several immediate and long-term risks and impacts for the transportation sector's day-to-day operations. Some specific risks that could affect your transportation business identified in the National Climate Change Action Plan (NCCAP) include:

- **Risk of damage to port facilities** from increasingly severe storm events and sea level rise.
- **Destruction of infrastructure including roads and bridges during storms**, which is increasingly becoming a common phenomenon during extreme weather events.

- **Flooding, contributed to by periodic torrential rainfall, poses a risk to maritime, road, rail and air networks.** Floods have had devastating consequences in recent years. For example, the 1997-98 El Niño floods are estimated to have caused damage equivalent to at least 11 per cent of GDP, including Ksh 62 billion in damage to transport infrastructure.[4]
- **Higher temperatures can cause pavement to soften and expand**, creating rutting and potholes; as well as warping of rail tracks, requiring track repairs or speed restrictions to avoid derailments.
- **Extreme weather may interrupt supply of raw materials** (such as metal and rubber), pose a threat to drivers, create delays and increase costs.
- **Drought and changes in water availability can increase your transportation costs**. For example, manufacturing vehicles require large amounts of water and increasing water scarcity may raise operating costs for companies that do not adapt.[5]

Climate change will affect all aspects of your transportation business; from the goods that you transport to the methods you use to transport them. Kenyan transport businesses are beginning to feel the impacts of climate change; yet adaptation planning is largely absent from business activities and decisions. Your business needs to prepare its assets and operations for climate change.

Figure 1: Low-carbon mitigation options the transport sector

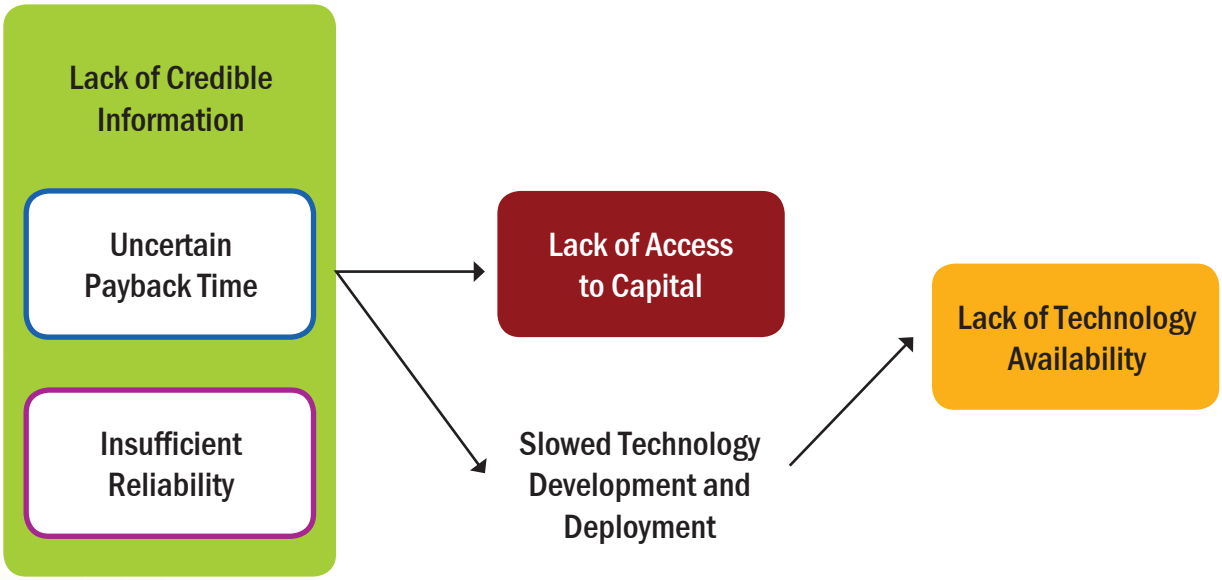


Source: International Institute for Sustainable Development and Energy research Centre of the Netherlands (2012). Mitigation: Chapter 7 – Transportation. Prepared for Kenya's National Climate Change Action Plan (2013-2017), page 12.

Reducing Greenhouse Gas Emissions in the Transport Sector

Transport sector greenhouse gas emissions are growing rapidly in Kenya. The NCCAP reports that emissions from the sector were equivalent to six million tonnes of carbon dioxide equivalent in 2010, or 10 per cent of national emissions.[6] These emissions are expected to rise to an estimated 19 per cent of total emissions by 2030. Priority areas for low-carbon development identified in the NCCAP include bus rapid transit, improved vehicle efficiency and shift of freight from road to rail (see Figure 1).

Figure 2: Barriers to uptake of fuel efficient technologies in vehicles



Source: Roeth, M., Kircher, D., Smith, J. and Swim, R. (2013), Barriers to Increased Adoption of Fuel Efficiency Technologies in the North American on-Road Freight Sector *(Washington, D.C.: International Council for Clean Transportation), page 5.*

The transport sector presents particular challenges for greenhouse gas emission mitigation, stemming from the lack of solid data on implemented transport policies and the complexity of the transport sector as a system. This complexity includes the high number and diversity of vehicles that are subject to millions of individual decisions, the slow turnover of the vehicle fleet, the high number of stakeholders involved, personal attitudes relating to vehicles and land use, and the technical challenges related to energy efficiency and alternative fuels.

Your transport business can reduce transport emissions, leading to cost savings through reduced fuel consumption. The transport system currently runs largely on petroleum products and the profitability is closely tied to oil prices.[7] Actions that improve fuel efficiency can introduce cost savings to your business while reducing greenhouse gas emissions. Such actions, as outlined The International Council for Clean Transportation, include:

- **Opting for more fuel-efficient vehicles** as you replace their vehicle stock, both light-duty passenger vehicles and trucks used primarily for freight transport. Many technologies are commercially available to improve the fuel efficiency of tractor-trailers, yet barriers mean that the technologies are slow to be adopted (see Figure 2).
- **Adopting fuel-saving technologies**, such as: engines, aerodynamics, tires and wheels, weight reduction, hybridization, transmissions, and driver coaching.
- **Introducing modern logistics brokerage practices**, including eliminating "empty backhaul" where a truck carries goods to a destination and returns empty to the starting point.[8]
- **Reducing the wait time at border crossings** to reduce emissions.

Another option for emission reductions is biofuels, although this is in a nascent stage in Kenya. Biofuels potentially can have net zero greenhouse gas emissions because the carbon dioxide emitted by biofuels can be balanced by the carbon dioxide absorbed during plant growth, potentially resulting in a fixed carbon cycle. However, the reality is complicated and certain factors – such as fertilizer used and the type of biomass displaced by crops – could increase net greenhouse gas emissions considerably. In some instances, the resulting greenhouse gas emissions from nitrogen releases may overwhelm other benefits. The "food versus fuel" debate means that promotion of biofuels tends to be controversial in Kenya.[9]

Climate Change and Your Transport Business: What can you do?

The NCCAP notes that a low-carbon climate resilient pathway for transport means that:

- Greenhouse gas emissions are as low as possible in the sector, recognizing that emissions will rise as Kenya develops; and
- Infrastructure is "climate proofed" or designed, constructed and operated in a way that accounts for anticipated risks and opportunities that result from climate change, ensuring that infrastructure investments are not compromised in the future (for more information see Briefing Note #2 – Climate Proofing Your Business).[10]

Your business can take steps to reduce emissions and adapt to climate change, including:

- **Assess climate change impacts on your transport operations, drawing on the information in the NCCAP.** You need to understand how climate change will affect your region and the risks this poses for your transport activities. Recognizing and understanding the impacts of climate variability is a first step and your assessment can look at:
  - Physical risks to transport resources – such as vehicles and vessels.
  - Risks to Infrastructure – such as impacts on roads, bridges, ports and railways.
  - Business and regulatory risks – such as changes in insurance coverage.
  - Market risks – changes in international competitiveness through transportation costs.

KEPSA can assist you by providing a list of publically available climate risk assessment tools (see Tools and Planning Instruments to Assess Climate Change Impacts).

- **Adapt your business to climate change.** This action depends on your location and the nature of your business. Examples include:
  - Ensuring your vehicle fleet and infrastructure can cope with heavier downpours.
  - Preparing vehicle operators to drive in variable weather conditions.
  - Incorporating expected climate impacts in planning and decision-making – such as transportation routes.
- **Encourage the government to climate-proof transport infrastructure.** Transportation infrastructure is vulnerable to weather extremes and climate-proofing is needed to increase resilience. As an example, the Integrated National Transport Policy 2010 recommends appropriate use of weather and climate information to ensure that infrastructure development (including port facilities, roads, railways and bridges) accounts for rising sea levels and increased occurrence of extreme weather events.[11]
- **Reduce greenhouse gas emissions in your business.** Many actions related to increasing fuel efficiency can be taken that reduce costs and greenhouse gas emissions (for instance, in trucks through the use of flaps, in aviation through updated navigation service). A useful conceptual tool to guide this work is the avoid-shift-improve approach:
  - **Avoid** means reducing the need to travel – such as creating local clusters of economic activity that require less mobility, changing how production is organized (such as doing more online) and developing multi-modal logistic chains to cut wasteful and unnecessary trips.
  - **Shift** means changing to more energy efficient modes or routes – such as shifting from road to rail or waterways, or onto well-defined trucking routes.
  - **Improve** means using technologies that are more energy efficient – including improved vehicle technologies and fuels, and improving transport efficiency using information technology.[12]
- **Encourage the manufacture of more efficient heavy-duty vehicle and passenger vehicle stock.** While the majority of automobiles currently in Kenya are imported, an increasing number are being manufactured domestically. Improving their efficiency would be beneficial in regard to both emission reductions and cost savings given the volatility of oil prices.[13] Domestically manufactured trucks, buses, trailers and matatus with improved efficiency would also provide lower operating costs as a sales incentive.

Acknowledgements

This briefing note was written by Deborah Murphy and Melissa Harris (International Institute for Sustainable Development). The authors thank Victor Ogalo, Kenya Private Sector Alliance, Maliza van Eeden and Margaret Kamau, Climate and Development Knowledge Network, and Tom Owino, ClimateCare, for providing useful comments.

For further information, please contact Victor Ogalo, KEPSA (vogalo@kepsa.or.ke), or Deborah Murphy, IISD (dmurphy@iisd.ca). Infor-mation about KESPA and its work can be found at www.kepsa.or.ke. Information about IISD and its work can be found at www.iisd.org.

Endnotes

1. Kenya National Bureau of Statistics (2013), *Kenya Facts and Figures 2012* (Nairobi: Kenyan National Bureau of Statistics), page 12.
2. Government of Kenya (2012), Adaptation Analysis and Prioritisation, *National Climate Change Action Plan 2013-2017* (Nairobi: Ministry of Environment and Mineral Resources).
3. Government of Kenya (2012).
4. IISD and ECN (2012).
5. Grossman, D. (2013). See also http://www.africareview.com/Business---Finance/Kenya-assembler-starts-building-Africa-s-cheapest-car/-/979184/1947478/-/jxsdm2/-/index.html.
6. International Institute for Sustainable Development (IISD) and Energy Research Centre of the Netherlands (ECN) (2012), Mitigation: Chapter 7, Transportation, prepared for Kenya's *National Climate Change Action Plan 2013-2017.*
7. Grossman, D. (2013), *GEO-5 for Business: Impacts of a Changing Environment on the Corporate Sector* (Nairobi: United Nations Environment Programme [UNEP]).
8. Roeth, M., Kircher, D., Smith, J. and Swim, R. (2013), *Barriers to Increased Adoption of Fuel Efficiency Technologies in the North American on-Road Freight Sector* (Washington, D.C.: International Council for Clean Transportation).
9. IISD and ECN (2012).
10. IISD, ECN and ClimateCare (2012), Low Carbon Climate Resilient Pathway, Prepared for Kenya's *National Climate Change Action Plan 2013-2017.*
11. Ministry of Transport (2010), *Sessional Paper on: Integrated National Transport Policy 2010* (Nairobi: Government of Republic of Kenya).
12. Asian Development Bank (2013), *Addressing Climate Change in Transport*, http://www.adb.org/sectors/transport/key-priorities/climate-change.
13. Global Fuel Economy Initiative (2012), *The Kenyan Developing Automotive Fuel Economy Policy* (Nairobi: UNEP).

This document is an output from a project funded by the UK Department for International Development (DFID) and the Netherlands Directorate-General for International Cooperation (DGIS) for the benefit of developing countries. However, the views expressed and information contained in it are not necessarily those of or endorsed by DFID, DGIS or the entities managing the delivery of the Climate and Development Knowledge Network*, which can accept no responsibility or liability for such views, completeness or accuracy of the information or for any reliance placed on them.

(T) +254 20 2730371 | 2 | 2727936 | 883
info@kepsa.or.ke | www.kepsa.or.ke
The Kenya Private Sector Alliance (KEPSA)
Shelter Afrique Building, 5th Floor, Mamlaka Road
P.O. Box 3556-00100 Nairobi Kenya