Ministry of Energy and Petroleum
State Department for Petroleum

REPUBLIC OF KENYA

EPRA
Energy & Petroleum Regulatory Authority

PETROLEUM DEVELOPMENT PLAN FOR THE MEDIUM-TERM PERIOD

2025 – 2029

JUNE 2025

KPC
KiPPRA The KENYA INSTITUTE for PUBLIC POLICY RESEARCH and ANALYSIS
KNBS KENYA NATIONAL BUREAU OF STATISTICS *Keeping you informed*
KENYA REVENUE AUTHORITY
KENYA PORTS AUTHORITY
KENYA VISION 2030
National Oil ENERGIZING KENYA

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FOREWORD

Kenya's petroleum sector is at a defining position, as the country balances its desired goals of attaining energy security, affordability and adequacy to support the productive sectors with the global imperative of reducing carbon emissions. Petroleum remains central to the country's transport, manufacturing and household sectors, yet reliance on fossil fuels also poses challenges to climate resilience and alignment with our commitments under the Paris Agreement. This Petroleum Development Plan (PDP) is therefore both timely and necessary as it provides a roadmap for developing necessary infrastructure for petroleum products' importation, discharge, delivery and local handling in the medium term. This includes a medium-term demand forecast, organized into future outlook scenarios and analyses how the country may develop a resilient and adequate investment package to meet the attendant infrastructure needs

This report covers the 2025-2029 period and provides a comprehensive analysis of Kenya's petroleum sector, examining its centrality to economic development, the demand and supply dynamics, and the infrastructure required to meet national and regional needs over the next five years. The plan focuses on the downstream and midstream segments of the value chain, with particular attention to discharge and loading, transportation and storage, distribution, and marketing, as well as the policies and regulatory measures necessary to ensure efficiency, security of supply and affordability.

The central goal of the plan is to steer Kenya towards a secure, efficient and inclusive petroleum sector. It ensures that the country can meet its growing energy needs while safeguarding affordability and competitiveness, all within the context of a just and orderly transition. By outlining sectoral trends, investment priorities and regulatory pathways, the PDP 2025-2029 offers actionable direction for sustaining petroleum as an enabler of development, while progressively managing risks and aligning with Kenya's broader vision of a resilient, low-carbon future.

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Director General

List of Acronyms

ADL	Anti-Adulteration Levy
AGO	Automotive Gas Oil
AGOL	African Gas Oil Limited
AVGAS	Aviation Gasoline
BAU	Business as Usual
BETA	Bottom-Up Economic Transformation Agenda
BOT	Build-Operate-Transfer
BPS	Budget Policy Statement
BVS	Beach Valve Station
CAK	Competition Authority of Kenya
CCG	Clean Cooking Gas
CEP	Cylinder Exchange Pool
COP	Conference of the Parties
COSSOP	Cost of Service Study for the Supply of Petroleum Products
CSR	Corporate Social Responsibility
CUM	Common User Manifold
DOSHS	Directorate of Occupational Safety & Health Services
DPK	Dual Purpose Kerosene
DWT	Deadweight Tonnage
EAC	East Africa Community
EIA	Environmental Impact Assessment
EMCA	Environmental Management & Coordination Act
EPRA	Energy and Petroleum Regulatory Authority
ESG	Environment, Social & Governance
EVs	Electric Vehicles
FDP	Field Development Plan
GDP	Gross Domestic Product
GDPPC	Gross Domestic Product Per Capita
G-G	Government to Government
GHG	Green House Gas
HFO	Heavy Fuel Oil
IDO	Industrial Diesel Oil
IK	Illuminating Kerosene
JKIA	Jomo Kenyatta International Airport
KAA	Kenya Airports Authority
KCAA	Kenya Civil Aviation Authority
KEBS	Kenya Bureau of Standards
KIPPRA	Kenya Institute for Public Policy Research and Analysis
KNBS	Kenya National Bureau of Statistics
KOJ	Kisumu Oil Jetty
KOSF	Kipevu Oil Storage Facility
KOT	Kipevu Oil Terminal
KPA	Kenya Ports Authority
KPC	Kenya Pipeline Company
KPRL	Kenya Petroleum Refineries Limited
KTMM	KIPPRA- Treasury Macro Model
LAPSSET	Lamu Port–South Sudan–Ethiopia Transport Corridor
LCPDP	Least Cost Power Development Plan

LEI	Leading Economic Indicators
LNG	Liquid Natural Gas
LPG	Liquid Petroleum Gas
MoE&P	Ministry of Energy & Petroleum
MSME	Micro, Small and Medium Enterprise
MtCO2eq	Million Tonnes of CO2 equivalent
MTP	Medium Term Plan
NCCAP	National Climate Change Action Plan
NDCS	Nationally Determined Contributions
NEAT	Ngamia, Amosing, Twiga & Ekales fields
NEECS	National Energy Efficiency and Conservation Strategy
NEMA	National Environment Management Authority
NOCK	National Oil Corporation of Kenya
NTSA	National Transport and Safety Authority
OMC	Oil Marketing Company
OTS	Open Tender System
PDP	Petroleum Development Plan
PMS	Premium Motor Spirit
PPA	Power Purchase Agreement
PPP	Public Private Partnership
SAF	Sustainable Aviation Fuel
SBM	Single Bouy Mooring
SME	Small and Medium-sized Enterprise
SOT	Shimanzi Oil Terminal
STOIIP	Stock Tank Oil Initially in Place
UNWPP	United Nations World Population Prospects
VTTI	Vitol Tank Terminals International
WKPE	Western Kenya Pipeline Extension

Executive Summary

The Energy and Petroleum Regulatory Authority (EPRA), in collaboration with sector agencies has developed an updated Petroleum Demand Forecast (2025–2029) and an infrastructure plan to guide policy interventions and investment in Kenya's petroleum sector. This review was necessitated by:

- Rapid changes in global oil supply chains due to geopolitical tensions and decarbonization efforts.
- Key domestic developments, including the commissioning of the Kipevu Oil Terminal (KOT-2) and the shift to a Government-to-Government (G2G) procurement framework for regulated petroleum products in the country.
- Emerging trends in energy transition, climate policies and evolving consumption patterns and,
- Recommendations drawn from the 2nd Cost of Service Study in Petroleum.

The demand forecast considered in this plan covered six petroleum products namely: Premium Motor Spirit (PMS), Automotive Gasoil (AGO), Illuminating Kerosene (IK), Jet Fuel, Liquefied Petroleum Gas (LPG) and Fuel Oil. Each of these products were modeled under baseline, optimistic and pessimistic scenarios based on economic, demographic, and policy drivers. The demand models estimated for each of the products was derived from determination of regressors, estimation of coefficients and validation of the models by undertaking in-sample forecasting to ascertain their accuracy. The main drivers of demand considered in the forecast include the prices of the respective products, exchange rates, Gross Domestic Product per Capita (GDPPC), vehicle population and demographic factors such as the size and distribution of the population among others.

Base year data for the different regressors were sourced from the most recent publications of the Kenya National Bureau of Statistics (KNBS), the United Nations(UN), Kenya Airports Authority (KAA), Kenya Ports Authority (KPA) , Vision 2030 targets and EPRA. The projections were based on PLATTS data, average historical trends and KNBS projections.

In the **baseline scenario**, demand is expected to grow at average annual rates as follows:

- **Premium Motor Spirit (PMS):** Increases from 2,044M litres in 2024 to 2,426M litres in 2029 representing a 3.35% annual growth rate. On the Other hand, **Automotive Gas Oil (AGO)** is forecasted to increase from 2,608M liters in 2024 to 3,099M litres in 2029, representing a 3.52% annual growth rate.
- The significant growth in demand for PMS and AGO is attributed to the expected increase in vehicle population, GDP and the possibility of dumping of internal combustion engines from the advanced economies following their faster transition to e-mobility.
- **LPG:** Increases rapidly from 415 KTonnes in 2024 to 589 KTonnes by 2029 representing 7.3% annual growth rate. This is supported by government clean-cooking initiatives in line with the LPG Growth Strategy.
- **Jet Fuel:** Increases from 972 million litres in 2024 to 1,067 million litres in 2029, a 1.87% annual growth rate. This is linked to increased air travel during the planning period. KCAA targets to increase both domestic and international aircraft movements to 380,000 by 2030.
- K**erosene (IK):** Declines from 47 million liters in 2024 to 37 million liters by 2029, representing a 4.57% annual decline. This is due to substitution by LPG, solar, and biofuels and the continued changing demand patterns by households.
- **Fuel Oil:** Increases from 332 million litres in 2024 to 378 million litres in 2027 after which it declines by an average rate of 3.19% to 356 million litres in 2029. This is due to the expected phase-out of thermal power plants under Kenya's climate commitment goals.

The demand forecast plays a key role in planning for petroleum infrastructure by assessing future developments of petroleum infrastructure needed including pipelines, storage facilities and common user petroleum and gas facilities.

Infrastructure Requirements

The petroleum infrastructure in Kenya plays a crucial role in ensuring a reliable supply of petroleum products for domestic consumption and regional exports. The current infrastructure includes various facilities such as receiving terminals, storage depots, pipelines and loading facilities that support the transportation and distribution of petroleum products.

The total national demand for white liquid fuels (except LPG & fuel oil) is expected to grow gradually from 5,933 million litres in 2025 to 6,630 million litres in 2029 averaging at a 3.18% growth rate annually. In evaluating the country's demand-supply balance, a 30-day stock cover was considered, being consistent with the national regulatory requirements of 15 days minimum operational stocks and 15 days of strategic reserves. This gives a reflection of planned supply which is expected to grow from 6,420 million litres in 2025 to 7,175 million litres in 2029. By providing infrastructure that meets these requirements, the country can avoid supply chain disruptions and hence enhance energy security.

Storage

This study concludes that there is adequate storage capacity for most products except LPG, which requires additional capacity by 2027. As at March 2025, the available storage capacity of petroleum products in licensed facilities was a total of 1,688.5 million litres while the storage for Liquefied Petroleum Gas was 44.43 million kilograms.

Prioritizing and expediting LPG storage infrastructure is essential to enhance supply security and support the clean cooking agenda. While expansion of storage at KPRL is underway, there is urgent need to accelerate complementary storage investments in hinterland regions such as Nairobi, Kisumu and Eldoret. These measures will strengthen national storage capacity, improve efficiency, lower costs, and expand access to LPG across the country.

Products evacuation facilities (Pipelines, jetties and loading arms):

The expansion of offloading facilities for petroleum products has increased import capacity in the recent past. However, an absence of parallel enhancements in pipeline and storage infrastructure may result in congestion, operational inefficiencies, and costly delays in product evacuation. These bottlenecks contribute to persistent demurrage costs, impacting overall supply chain efficiency.

In addition, there is need to upgrade **Mombasa-Nairobi Line 5** and expand western Kenya networks to meet rising demand after 2028. In the interim, however, there is need to optimize existing truck loading facilities in Nairobi and Nakuru as they are capable of knocking off 1,900 m3 of pipeline requirements to the western part of the country when fully operational.

With respect to products evacuation, it is proposed that the Ministry develops a policy on multi-modal transportation of petroleum products to optimize rail and road transport alongside pipelines to enhance supply chain resilience.

From the report, the following recommendations emerge:

a) To ensure a steady and uninterrupted supply of petroleum products, it is imperative to enhance both storage and evacuation capacity to match the rate of discharge at the new KOT- 2 jetty as illustrated in Table 514.

b) Initiate procurement and development of line 7 to increase pipeline capacity and improve product flow efficiency between Mombasa and Nairobi by 2028.

c) Upgrade capacity of line 4 to meet increasing demand in Western Kenya and transit demand.

d) Initiate procurement of an additional pipeline from Sinendet to Kisumu by 2029 to serve increased regional demand.

e) Due to the expected growth of demand in LPG the country shall need an additional 6.5 thousand metric tonnes of storage capacity needed to be installed by 2028 to cater for both national and transit markets.

f) The country continues to realize increased investment of primary storage for LPG at the coastal region. However, the current mode of transportation of this product to the hinterland and export market is by road tankers. This is an inefficient mode for such a large quantity of LPG.

g) To improve on the evacuation rate of LPG, it is proposed that a 10 thousand metric-ton secondary storage should be constructed in Nairobi which is served by a railway siding. One to fivethousand metric-ton secondary storage can be considered for Kisumu and Eldoret to serve surrounding regions.

h) To meet the demands for the LPG markets, it is essential to utilize multi-modal transport systems including railway and roads. This will ensure adequate supply of LPG both in the mainland and hinterland with Government efforts to increase demand for the product.

i) Reticulation of LPG in gated communities and apartments as well as learning institutions is gaining popularity. It is proposed that the Authority develops tariff setting methodologies to ensure cohesive relationship between the infrastructure owner/ operator/suppliers and the users.

j) Scale up LPG for cooking by promoting reticulation of LPG in gated communities and apartments as well as learning institutions.

k) There is need to continue implementing the National LPG strategy which recommends intensification of LPG use in the country.

l) The Authority should undertake a sub-national petroleum demand study to guide new infrastructure development.

1. Introduction

1.1 Background

Globally, oil and gas supply chains are having an increased impact on the economy affecting industries, services, transport and individuals by the fluctuations in both price and supply. Consequently, measures to reduce and mitigate risks have driven the need to develop tools to forecast future demand. The Energy and Petroleum Regulatory Authority (EPRA), in collaboration with Kenya Institute for Public Policy Research and Analysis (KIPPRA), developed an Integrated Demand Forecast Model for selected petroleum products in the country. EPRA, KIPPRA, and sector agencies utilized the tool and presented a 20-year demand forecast report for the country.

Furthermore, the sector finalized the 2020-2040 report and with rapid changes in the oil and gas supply chain brought about by geopolitical tensions, rising prices, and the global push for de-carbonization, energy transition and a green economy necessitated a review of the demand forecast through the long-term plan report 2024-2043. However, significant developments in policy, regulatory and operational frameworks necessitated a review of the plan through a Medium-term Plan.

The publication of Petroleum (Pricing) Regulations 2022 and Petroleum (Importation of Petroleum products) Regulations 2023 impact petroleum product consumption in Kenya by influencing price stability, supply chain efficiency, and market competition. Additionally, the commissioning of the KOT-2 in August 2022 and the adoption of the Government-to-Government framework in 2023 have impacted the supply chain. These developments and changing macroeconomic fundamentals necessitated the review of assumptions and consequently re-estimation of forecast equations to incorporate the changes.

Consequently, the sector technical committee undertook the review of the long-term plan 2024-2043 and prepared a medium-term plan 2025-2029. The technical committee comprises of representatives from the State Department of Petroleum, National Oil Corporation (NOCK), Kenya Petroleum Refineries Limited (KPRL), Kenya Pipeline Company (KPC), Kenya Revenue Authority (KRA), Kenya National Bureau of Statistics (KNBS), Kenya Ports Authority (KPA), the Kenya Vision 2030 Secretariat and the Energy and Petroleum Regulatory Authority (EPRA). The review and updates were undertaken through EViews Statistical Software for econometric analysis with the modelling based on actual demand consumption data while the assumptions made during the previous demand forecast were revalidated.

1.2 Objectives of PDP

The objective of the petroleum demand forecast is to offer a projection of demand for petroleum products over the medium-term period 2025-2029. This forecast considers various factors including governmental strategies, economic and development plans, prevailing macroeconomic indicators, and future outlook for petroleum products demand. This plan will form a reference for future petroleum demand requirements and assessment of the necessary investment in infrastructure and policy gaps in the sector.

The specific objectives are:

a) To review the forecast assumptions and update them in line with current macroeconomic indicators and policy changes.

b) Determine variables influencing petroleum products' demand and their effect on demand.

c) To forecast demand for selected petroleum products consumption in Kenya for the medium-term period 2025-2029 and;

d) To develop a petroleum infrastructure plan over the medium-term period 2025-2029.

The demand forecast is expected to be used by stakeholders to inform their investment programs while engaging with their development partners on implementation support, as well as guide the Government and its agencies on necessary interventions to address emerging issues and concerns.

2. Overview of the Industry

Kenya's petroleum sector is a pivotal component of the country's broader energy landscape, contributing significantly to economic development, trade, and regional integration. Historically, Kenya has relied heavily on imported petroleum products to meet its domestic energy demands. However, the discovery of commercially viable crude oil reserves in the Lokichar Basin in Turkana County in 2012 marked a transformative moment for the nation's aspirations of becoming a petroleum producer. This shift from a purely import-dependent state to a prospective oil exporter has catalysed and informed policy reforms, infrastructural investments, and socio-economic discourse surrounding resource governance.

The petroleum value chain in Kenya spans from upstream, midstream, and downstream segments. Upstream activities encompass exploration and production, while midstream operations involve transportation infrastructure including pipelines and storage facilities. Downstream operations – comprising of importation, refining, distribution, and marketing of petroleum products - remain the most active segment. This chapter provides comprehensive overview of Kenya's petroleum sector examining its current status, key players, policy and regulatory frameworks and reforms.

2.1 Petroleum Value Chain

The petroleum value chain is organized into three sub-sectors. Upstream, Midstream and downstream as illustrated in Figure 2.1.

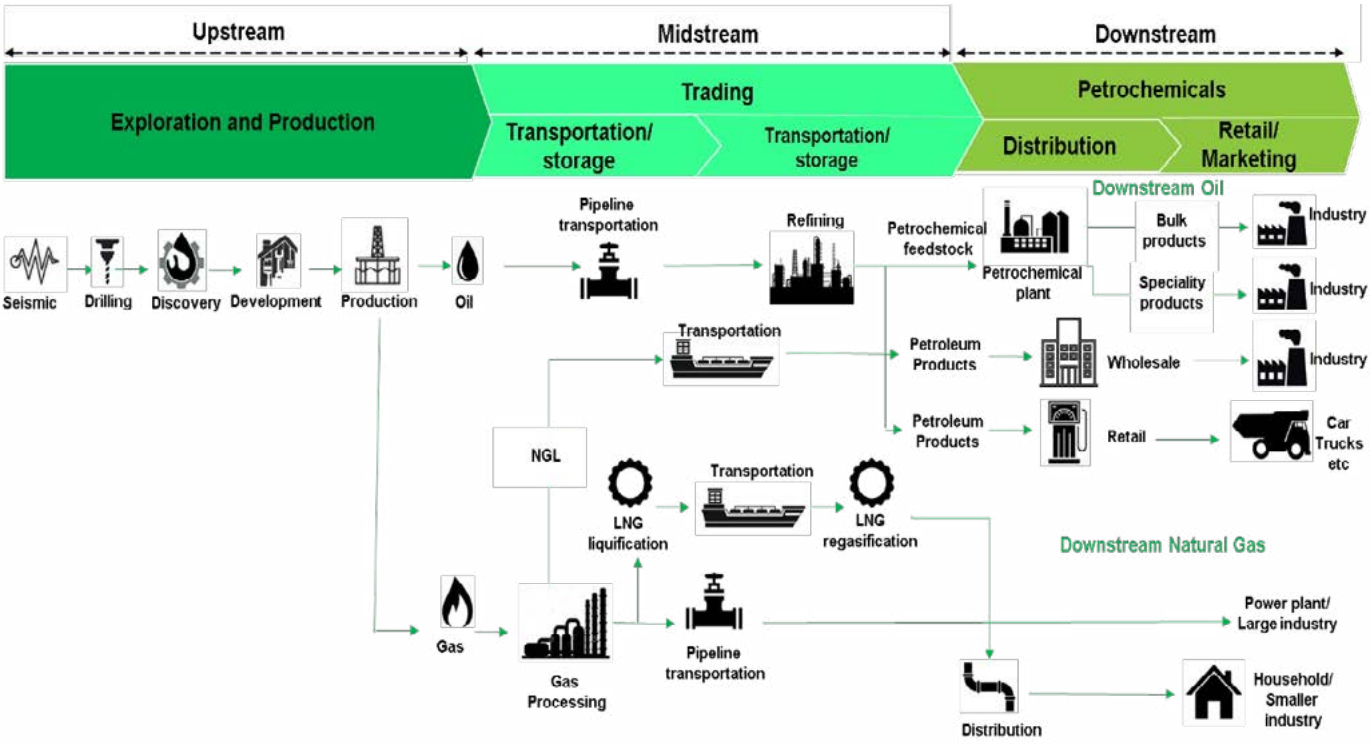

Figure 2.1 Petroleum value chain subsectors

Upstreamsector: Upstream petroleum operations encompass all activities related to the exploration, development, production, separation and treatment, storage, and transportation of petroleum up to the agreed delivery point.

The Lamu Port is a vital part of the LAPSSET project, which aims to create a transport corridor connecting Kenya, Ethiopia, and South Sudan. The port has been identified as the delivery point for crude oil export in the upstream project. The first three berths of the Lamu Port in Kenya are complete and operational, with Berth 1 dedicated to containerized cargo. The port is designed to be a multipurpose facility, handling a variety of cargo including containerized, general cargo, liquid bulk, coal, Liquefied Natural Gas (LNG), and oil products.

In Kenya, exploration activities are ongoing both onshore and offshore. Upstream operations aim at maximizing production at optimal costs along the petroleum value chain.

To date, ninety-four (94) exploration wells have been drilled by various oil exploration companies across four sedimentary basins. These basins cover a total surface area of 485,000 km² and are divided as follows: Lamu Basin: 261,000 km², Mandera Basin: 43,000 km², Anza Basin: 81,000 km² and Tertiary Rift Basin: 100,000 km². Figure 2.2 shows the map of sedimentary basins while Figure 23 shows the petroleum exploration blocks map.

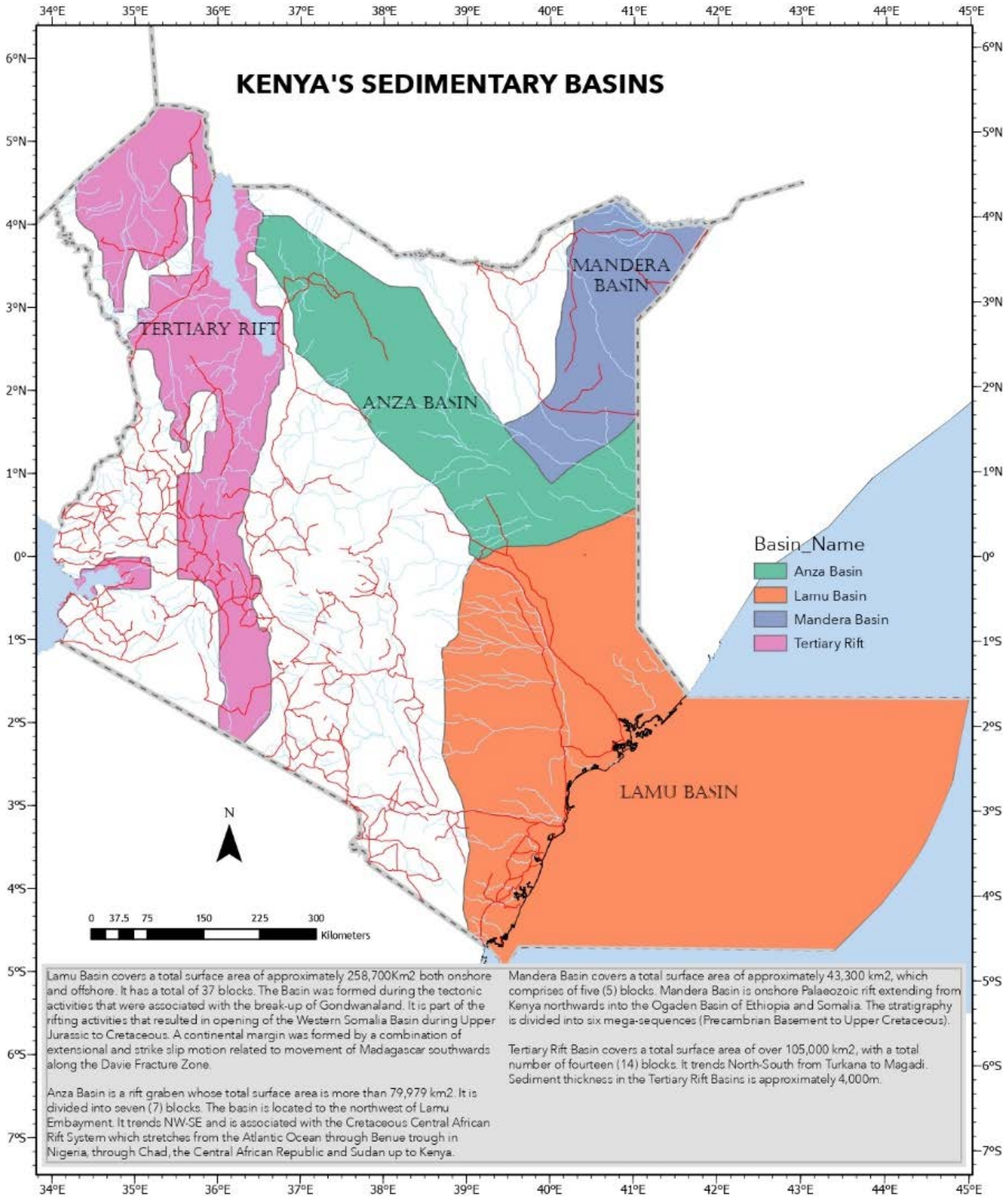

Figure 2.2: A map of sedimentary basins

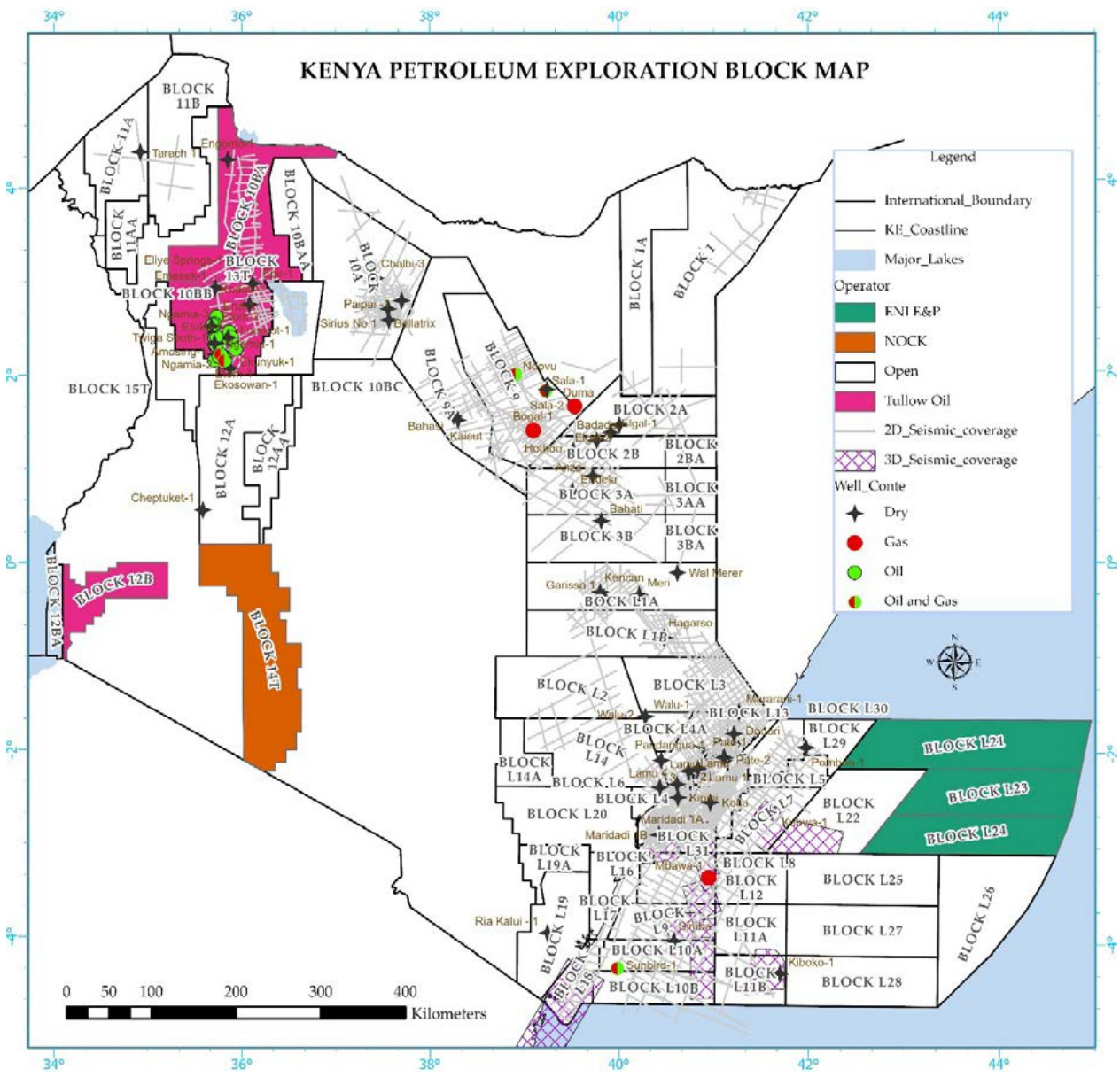

Figure 2.3: Map of Petroleum Blocks

The Kenya government is presently in the process of evaluating the Final Field Development Plan (FDP) submitted by Tullow Oil. This comprehensive FDP outlines a strategic roadmap for the development of resources within Block 10BB – 13T license areas, as well as additional appraisal and exploration activities aimed at optimizing resource extraction within the designated development zone.

The development strategy revolves around a well-structured, phased infrastructure-driven approach, commencing with the most sizable and technically advanced reservoirs. To achieve the production of first oil and support the initial production plateau, the Ngamia, Amosing, Twiga, and Ekales fields, collectively referred to as "NEAT," will be developed within the first five years of the production period.

The development aims to tap into a discovered Stock-Tank-Oil-Initially-in-Place ("STOIIP") range spanning from 1,620 to 4,573 million barrels and anticipates the recovery of an estimated 240 to 971 million barrels of contingent resources over the course of the 25-year contract period.

Mid-stream sector: comprises storage, refining of crude oil into consumable petroleum products and transportation of the same. With the mothballing of the Kenya Petroleum Refineries Limited (KPRL) plant at Changamwe in Mombasa, Kenya currently imports all its petroleum products requirements as refined products. The (MoE&P) coordinates the bulk procurement of refined product through the Government-to-Government (G-G) framework or Open Tender System (OTS) as provided by the Petroleum (Importation) Regulations of 2023. The Kenya Pipeline Company (KPC) provides product movement infrastructure including storage, pipeline transport and handling services.

Downstream sector: refined products are made available to the consumers through supply and distribution. Distribution and marketing of petroleum products is done by oil marketing companies, and products supplied through retail stations. According to EPRA data, Kenya has over 5,800 retail stations. The stations are classified as Tier 1, 2, 3 and 4 depending on land area, services offered and storage capacity.

2.2 Mid and Down Stream Sector Structure

The mid and downstream petroleum sector in Kenya focuses on the distribution of refined petroleum products to end-users. This includes products like petrol, diesel, jet fuel, kerosene, lubricants and LPG. The mid and downstream petroleum sector in Kenya is structured in the manner described in Figure 2.4.

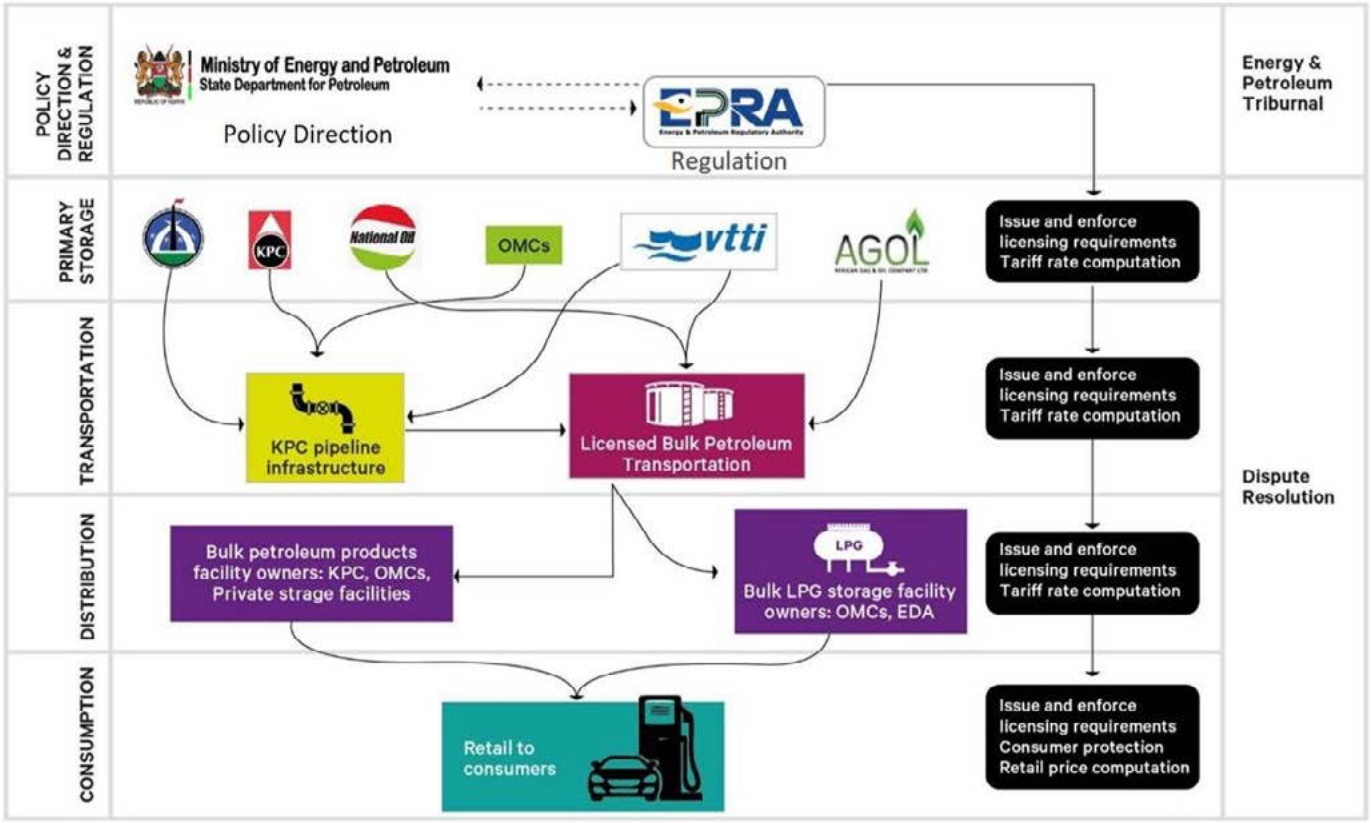

Figure 2.4: Structure of the downstream petroleum sector

The responsibilities of the petroleum sector organizations and other stakeholders are summarized below:

a) **The Ministry of Energy and Petroleum** is responsible for formulating and overseeing policy implementation in the petroleum sector and establishing the sector's strategic direction.

b) **The Energy and Petroleum Regulatory Authority (EPRA)** is responsible for economic and technical regulation of the energy and petroleum sectors.

c) **Energy & Petroleum Tribunal** is responsible for settling disputes and appeals in accordance with the Constitution of Kenya 2010, Energy and Petroleum Acts 2019, and any other relevant law.

d) **Kenya Pipeline Company (KPC)** is a state-owned corporation whose primary function is to handle and transport petroleum products imported into the country.

e) **National Oil Corporation of Kenya (NOCK)** is a state-owned corporation that participates in all aspects of the petroleum supply chain covering upstream oil and gas exploration, midstream petroleum infrastructure development, and downstream marketing of petroleum products.

f) **Oil marketing Companies (OMCs)** are companies licensed by the Authority to import petroleum products into the country.

g) **Vitol Tank Terminals International (VTTI)** Kenya is a privately owned bulk petroleum facility located in Mombasa which receives and backloads petroleum products from petroleum marine tankers.

h) **African Gas Oil Limited (AGOL)** is a privately owned LPG bulk receiving terminal located in Mombasa with a storage capacity of 25,000 Mt.

i) **Kenya Ports Authority (KPA):** This is a government agency that owns, operates and regulates the ports in Kenya including Kilindini & Likoni harbours, Lamu and Kisumu. They have concessioner construction on a Build-Operate-Transfer (BOT) basis of an LPG Single-Bouy Mooring (SBM) and common user facility.

j) **Kenya Petroleum Refinery Limited (KPRL):** is a state-owned corporation whose primary function is to handle petroleum products imported into the country including LPG.

k) **Kenya Bureau of Standards (KEBS):** has the responsibility of setting standards for use in the country in consultation with all relevant stakeholders.

l) **Directorate of Occupational Safety and Health Services (DOSHS):** This body enforces the provisions of the OSH Act and the WIB Act.

m) **National Environment Management Authority (NEMA):** This is the coordinating body for all environmental issues in Kenya.

n) **Licensees:** Petroleum licensees are classified into the following categories: -

- Importers of petroleum products (Currently totalled at 147 licensees)
- Storage depots (Currently totalled at 40 licensees)
- LPG Storage and Filling Plants (Currently totalled at 145 licensees)
- Pipeline transportation (1 licensed pipeline transporter)
- Wholesalers and Exporters (Currently totalled at 996 licensees)
- Transporters of bulk LPG by road (Currently totalled at 133 licensees)
- Transporters of petroleum products by road (Currently totalled at 1,005 licensees)
- Petroleum Tanker Drivers (Currently totalled at 9,981 licensees)
- Storage of Crude Oil (Currently 1 licensed facility)

Some of the companies operate in almost all the above licensable activities. Observance of fair competition is regulated in liaison with the Competition Authority of Kenya (CAK).

2.3 Petroleum Grades

The Kenya petroleum product market comprises of over ten (10) differentiated products under the trade names itemized below:

1. Aviation gasoline (Avgas)
2. Jet A-1
3. Premium Motor Spirit (PMS)
4. Illuminating Kerosene (IK)
5. Automotive Gas Oil (Light Diesel Oil) (AGO)
6. Industrial Diesel Oil (Heavy Diesel Oil) (IDO)
7. Fuel Oils
8. Bitumen
9. Lubricating oils
10. Lubricating greases; and
11. Liquefied Petroleum Gas (LPG).

2.4 Legislative, Policy and Regulatory Frameworks

Kenya's petroleum planning is governed by a comprehensive framework encompassing legislative, policy, and regulatory instruments. These frameworks ensure the sector's development aligns with national interests, environmental sustainability and economic growth.

2.4.1 Legislative

The Constitution of Kenya (2010)

- The constitution establishes the foundation for natural resource management, emphasizing equitable sharing of benefits, public participation, and environmental protection.

The Energy Act, 2019

- The Act consolidates the laws relating to energy, provide for National and County Government functions in relation to energy planning and establishes the energy sector entities. The Act also supports promotion of renewable energy, exploration, recovery and commercial utilization of geothermal energy. Additionally, it lays foundation for regulation of midstream and downstream petroleum, production, supply and use of electricity and other energy forms including coal.

The Petroleum Act, 2019

- The Act provides a framework for the contracting, exploration, development, and production of petroleum and cessation of upstream petroleum operations. It also gives effect to relevant articles of the Constitution that apply to upstream petroleum operations and regulation of midstream and downstream petroleum operations.
- It establishes institutions like the National Upstream Petroleum Advisory Committee to advise on upstream operations.
- It mandates the development of a National Petroleum Strategic Plan to guide sectoral planning and investment.

The Petroleum Development Fund Act 4 of 1991

It was enacted in 1991 for the establishment of a Petroleum Development Fund and the imposition of a Petroleum Development Levy. The fund is used for development of common facilities for the distribution or testing of oil products and for matters relating to the development of the oil industry.

2.4.2 Policies

After constitution of the Kenya Kwanza Government in 2022, there was a shift in policy direction intended to meet the aspirations of the new Government with focus largely on housing development, ICT, the creative industry, agriculture, Small and Medium-sized Enterprises (SMEs) and health. In addition, the Government adopted a conscious policy of subsidizing production as opposed to consumption which led to the need to eliminate petroleum price subsidies. . Some of the key legislative and policy reforms defining this report include:

i) **Vision 2030:** Launched in 2008, this serves as the national blueprint for the long-term development of the country. Energy is recognized as an infrastructural enabler of the three pillars of Kenya's vision 2030. Among the key projects identified in the policy document is the pipeline component of the LAPSSET project.

ii) **Bottom-Up Economic Transformation Agenda (BETA):** BETA constitutes the medium-term economic agenda for the Government covering the period 2022-2027. It aims to stimulate economic recovery and bolster resilience and is being implemented across five priority areas namely: Agricultural Transformation, Micro, Small and Medium Enterprises (MSME) Economy, Healthcare, Housing and Settlement, Digital Superhighway and Creative Industry. The infrastructure sector, in which oil and gas is domiciled remains a critical enabler to the five pillars.

iii) **The Draft National Petroleum Policy, 2025:** This policy covers the entire petroleum industry, establishes checks and balances necessary to ensure that oil and gas sector supports the country's sustainable growth, while addressing the negative consequences of petroleum development including environmental degradation. It applies to all petroleum operations in the country and cross border operations that impact the country and provides guidance to all the sector stakeholders. It also forms the basis for development and implementation of the oil and gas sector's legal, regulatory and institutional framework.

iv) **Draft National Energy policy:** The Draft Energy policy contains the institutional arrangements envisaged for management of the broader energy sector which incorporates the petroleum value chain. It also defines the regulatory framework expected to govern the entire energy value chain and is therefore a complementary policy to the (iii) above.

v) **Sessional Paper No. 4, 2004 on Energy:** This is the immediate former policy guiding the development of the energy and downstream petroleum sectors that gave birth to the repealed Energy Act 2006. The Sessional Paper provides legal, regulatory and institutional frameworks supporting operations of the upstream, midstream and downstream sub-sectors.

2.4.3 Regulations

Following the enactment of the Energy and Petroleum Acts 2019, the Authority embarked on the process of review of existing regulations and development of new ones to give effect to the proposals in the mother Act. To this end, a total of not less than 23 regulations are at various stages of development to accommodate the substantive changes introduced by the Petroleum Act, 2019. The regulations cover broad topical issues including: Petroleum and petroleum facilities licencing; information and statistics; common user facilities; operations; security of supply of petroleum products; safety and security, environmental health and safety; trading including importation, transportation and storage; crude oil exploration and processing; royalties and local content.

2.5 Reforms in the Petroleum Sector

Kenya's petroleum and gas subsector has undergone significant policy, regulatory and institutional reforms over the years to strengthen its governance, attract investment and facilitate the exploration and exploitation of the resources that define it. Specifically, there have been institutional reorganization to accommodate these changes largely focused on the regulatory environment but also intended to facilitate more effective operations. The country's approach towards these reforms includes legislative, policy, institutional, and procedural changes to capture local and international changes in the operational environment.

2.5.1 Policy evolution

The policy environment around petroleum and gas has been significantly dynamic beginning with the highly regulated pricing regime of the 1970s to the liberalized environment of the 1990s and back to a price regulated regime reintroduced in 2010 for selected products that remain to date.

Operationally, the liberalization regime was characterized by a huge growth in retail outlets though this also introduced an undesirable proliferation of substandard retail outlets and significant challenges such as product adulteration and tax evasion through export dumping. There were also serious malpractices in the LPG segment such as cross-filling of cylinders, under-dispensing and overpricing of products.

Sessional paper No 4 of 2004 provided a framework for policy and regulatory interventions to deal with these challenges and has continued to be the reference policy since then. Among others, the sessional paper strengthened the governance structure across the petroleum value chain clearly defining an elaborate framework to deal with policy, regulatory, legislative and operational aspects of the sector. These reforms facilitated greater participation of varied players across the value chain through licensing and regulatory oversight, particularly in the importation, distribution, and supply of petroleum and Liquefied Petroleum Gas (LPG). Further the Vision 2030, a development blueprint was formulated with the intention of establishing a transport corridor from Lamu to Lokichogio through Isiolo and Lodwar that would have an oil pipeline and an oil refinery at Lamu.

Due to emerging economic, social and legal issues coupled with a changing geo-political environment, there have been concerted efforts to update the petroleum and gas policy environment. Accordingly, the country is in the process finalizing the revision of the Energy policy and developing a National Petroleum policy. The policies emphasize on several salient issues that include; promotion of clean cooking technologies and reduction of reliance on biomass fuels; enhancement of energy efficiency and conservation in all sectors; fostering of innovation through emerging technologies, capacity development, technology transfer and financing mechanisms; and supporting a just and equitable energy transition aligned with global climate goals.

The National petroleum policy specifically highlights several objectives including:

a) Enhancement of storage and transportation capacity of petroleum products.
b) Promotion of value addition of petroleum resources to meet local and regional demand.
c) Ensuring security of supply of petroleum products.
d) Enhancement of LPG uptake in the country.
e) Enhancement of support to upstream activities and
f) Enhancement of management of revenue from oil and gas resources.

Energy and petroleum play a crucial role as enablers of economic growth and social development under Kenya's Vision 2030, which aspires to transform the country into a newly industrialized, middle-income economy. Access to reliable, affordable, and sustainable energy is recognized as essential to achieving this vision.

From a political context, BETA aligns well with these objectives and will provide a medium-term framework for implementation of the overall Petroleum policy. BETA emphasises the establishment of a legal framework to ring-fence fuel stabilization fund and foster clean cooking. It also aligns with the Kenyan constitution 2010 and its broader aspiration of a people with high standards of living in a clean healthy environment.

2.5.2 LPG Supply Chain Reforms

Under the LPG segment, major interventions are envisaged and are captured under the National LPG Growth Strategy (2023). The key ones include:

a) Intensification of the use of LPG by domestic consumers as a transition fuel through facilitation of access to the product. This will be by providing cylinders to consumers at subsidized prices by the government and targeted partners.

b) Supporting LPG use in learning institutions, hospitals, correctional institutions and qualified security camps through targeted programmes.

c) Introduction of more common user facilities at the landing ports and hinterland.

d) Introduction of an open tender mechanism for procurement of LPG with an initial G-G arrangement akin to that applied for regulated petroleum products.

e) Targeted fiscal interventions to reduce the price of LPG and;

f) Intensification of LPG monitoring to manage malpractices such as cross-filling, under-dispensing and enhancement of safety and security measures across the value chain.

These measures build on earlier policy changes including the abolishment of the mandatory cylinder exchange pool and in its place introduction of the voluntary Mutual Cylinder Exchange System.

2.5.3 Legislative Reforms

Following the enactment of the Energy Act 2019 Cap (314) and the Petroleum Act 2019 (308) review of the necessary legislative framework supporting oil and gas has been ongoing with up to 21 regulations at various stages of development. Three (3) regulations namely, Petroleum (Liquefied Gas) Regulations 2019, the Petroleum (Pricing) Regulations 2022 and Petroleum (Importation) Regulations 2022 were approved and gazetted while the rest are at various stages of enactment. Six of these regulations cover the upstream segment of the value chain while the rest cover midstream and upstream issues.

As part of the regulatory reforms, Kenya has made significant strides in integrating Environmental, Social, and Governance (ESG) principles in the petroleum subsector. The Environmental Management and Coordination Act (EMCA) require that all oil and gas projects undergo a rigorous assessment of potential environmental impacts. The regulations also mandate EPRA to be a lead agent in the management of EHS for petroleum and energy projects.

2.5.4 Institutional Reforms

Besides the restructuring of the regulatory environment, the Government is in the process of undertaking reforms in the National Oil Corporation of Kenya (NOCK) given its strategic importance at retail level and at upstream level. To this end, reforms are ongoing aimed at enhancing the corporation's efficiency and enabling it to actively participate in petroleum exploration, production, and marketing alongside private players. NOCK's restructuring efforts focus on improving its capacity to contribute to national energy security and ensure that the country can efficiently tap into its oil reserves. The government is hence in the process of establishing subsidiaries to deal with retail, upstream exploration and strategic reserves arm.

2.5.5 Local Content Policy

Kenya has introduced the Local Content Policy, aimed at ensuring that the petroleum sector maximizes opportunities for local businesses and communities. The Petroleum Act (Cap 308) has provisioned for local content in the petroleum sector. Further the draft petroleum local content regulation is under development. This has been entrenched in the draft National Petroleum Policy.

The policy mandates the use of Kenyan workers, goods, and services in oil and gas operations, creating opportunities for job creation, skills transfer, and the growth of local suppliers. This is part of the country's broader goal of promoting economic diversification and reducing dependence on imports.

The policy requires foreign companies operating in Kenya to implement strategies that enhance local participation and workforce development, as well as engage in community development projects to improve the socio-economic status of oil-producing regions.

2.5.6 Consolidated Fund Framework

As part of ongoing reforms, Kenya proposes to establish a petroleum consolidated fund to manage sector issues such as decommissioning of petroleum infrastructure, development of common user facilities, education, and health services among others.

2.5.7 Petroleum products pricing policy

TThe petroleum products pricing regime for selected products, was introduced in 2010and has been operational since then. The prices for AGO, IK and PMS are determined through a formula managed by EPRA and whose critical parameters are determined periodically through a Cost-of-Service Study. Recent policy changes with respect to petroleum and LPG subsectors have included:

a) Transition from the traditional Open Tender System (OTS) to a Government-to-Government (G-G) procurement mechanism for regulated petroleum products.

b) Unbundling of the storage and pipeline tariffs to reflect the investment as per individual infrastructure.

c) Proposal to introduce a bulk procurement process of LPG in the country based on a uniform gate price.

d) Proposal to vary the reference pricing terminal for PMS to Arabian Gulf as opposed to Mediterranean that is currently applicable.

2.6 Petroleum Sector Performance

2.6.1 Petroleum products consumption

Kenya continues to be a net importer of petroleum products with marginal increase in imports over the years. Demand for AGO rose from 2,187 thousand tonnes in 2023 to 2,194 thousand tonnes in 2024, while PMS increased from 1,446 thousand tonnes in 2023 to 1,473 thousand tonnes in 2024 a growth driven by rising demand in the transport sector.

Conversely, demand for illuminating kerosene has experienced a notable decline since 2018, primarily due to the anti-adulteration levy introduced that year, which significantly raised its price. LPG consumption increased from 365 thousand tonnes in 2023 to 415 thousand tonnes in 2024, supported by government initiatives aimed at promoting its use in both households and institutions. Figure 25 provides an overview of petroleum consumption from 2010 to 2024.

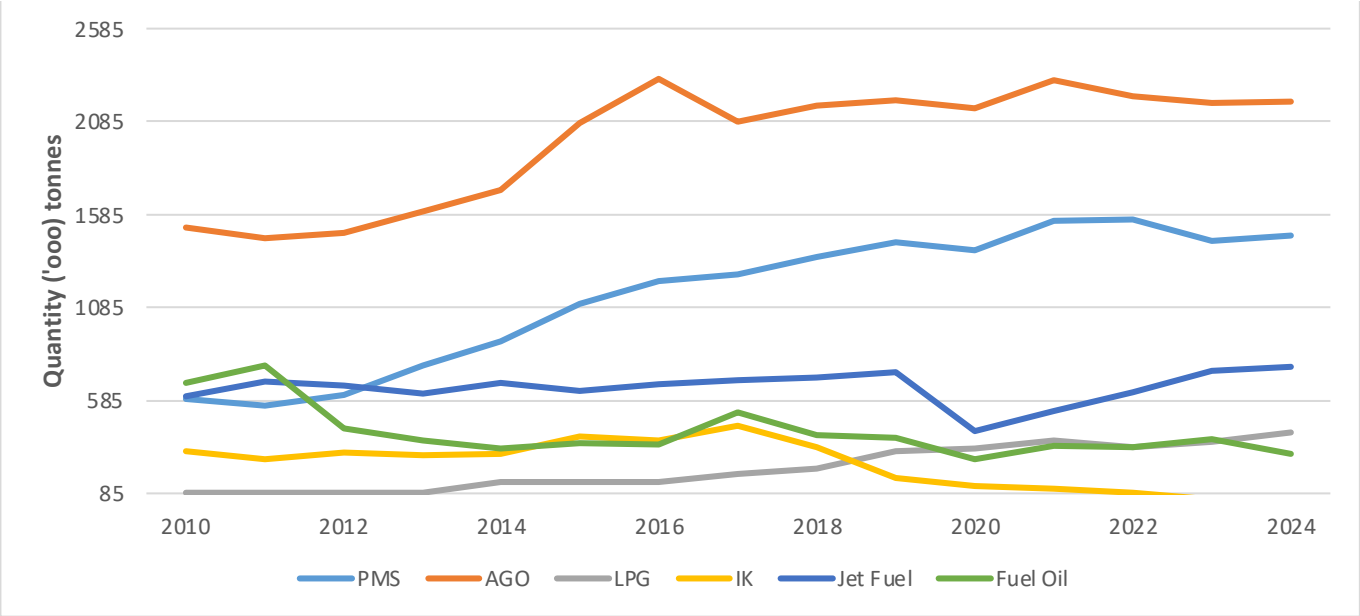

Figure 2.5: Petroleum Products Consumption, 2010-2024

2.6.2 Prices of Petroleum products

Petroleum prices in Kenya are regulated by EPRA, which publishes updated prices for petrol, diesel, and kerosene on the 14th day of each month. The trends in the average prices during the period 2010-2024 are depicted in Figure 2.6.

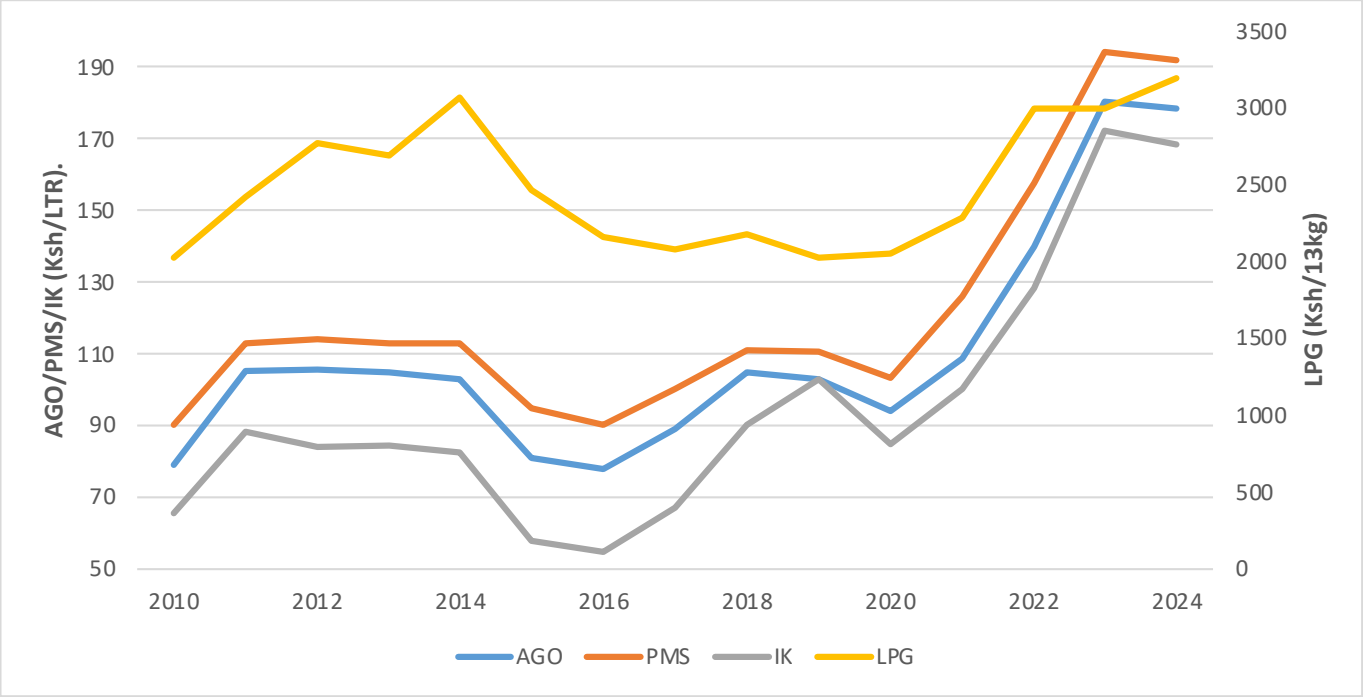

Figure 2.6: Average Prices of Petroleum Products, 2010-2024

Petroleum product prices in Kenya have generally shown an upward trend over the period. This is influenced by several factors, including international Murban crude oil prices, landed costs, freight charges, customs taxes, storage, and handling costs, among others.

3. Petroleum Product Demand Forecasts

Forecasting petroleum products' demand is a critical component of national energy planning, offering essential insights for infrastructure development, supply chain optimization, and energy policy formulation. In Kenya, understanding the dynamics of petroleum consumption supports strategic decision-making for both public and private stakeholders. This section presents forecast estimates for six major petroleum products based on rigorous econometric modelling. The methodology and assumptions underlying these projections are also discussed in detail.

3.1 Analytical and Methodological Approach

The general approach to forecasting petroleum products' demand in Kenya aligns with energy demand modelling principles, hypothesizing that demand is influenced by various factors and supported by the theory of demand. Considering data availability, demand models are developed for AGO, Premium Motor Spirit PMS, IK, Jet-A1, Fuel oil, and LPG. These models employ consumption of the products as the dependent variable, each regressed against a set of specific independent variables, to ascertain the total demand nationwide.

3.2 Petroleum Demand Forecasting Procedure

The procedure adopted for demand forecasting is as detailed below:

i) Undertaking literature review for the demand of petroleum products in Kenya.

ii) Sourcing data from credible institutions or entities.

iii) Cleaning data, checking summary statistics and unit root testing.

iv) Using general-to-specific procedure to estimate the demand equations for the various petroleum products, including running pre and post-estimation diagnostics for time series data using EViews Software.

v) Undertaking in-sample forecasting to ascertain the accuracy of the model by comparing the historical and back-casted data.

vi) Inputting the estimated coefficients into the excel-based model ready for forecasting.

vii) Forecasting the demand for each of the six petroleum products; and

viii) Assessing and validating the projections obtained for the various petroleum products.

3.3 Main Drivers of Petroleum Demand

The main factors considered that influence demand for petroleum products in Kenya include the following:

i) Prices of the respective commodities

Economic theory dictates that an increase in the price of goods and services reduces their respective demand while a decrease in the prices increases their respective demand, for normal goods. Petroleum products are essential in nature; hence their consumption is responsive to price changes. For instance, diesel-consuming plants and factories may scale down their operations because of high diesel prices and car owners may fuel less when diesel and petrol prices rise beyond their purchasing power. Similarly, if the price of cooking gas rises sharply, households might use less gas for cooking and look for alternative methods. This therefore explains the negative relationship between consumption and prices for all the six classes of petroleum products considered in this forecast.

ii) Gross Domestic Product Per Capita

The Gross Domestic Product Per Capita (GDPPC) is calculated as the GDP divided by the population in an economy. The GDP, being total monetary value of all finished goods and services produced in a country, reflects the size of an economy. The GDPPC is therefore an indicator of the income level or purchasing power of consumers in an economy. Ideally, increased production leads growth in an economy's GDP and as a result, the GDPPC increases. Higher purchasing power of consumers is likely to increase the demand for petroleum products, given that other economic conditions do not change.

iii) Exchange rates

A depreciation of the Kenya shilling means that we spend more units of the local currency to exchange for a unit US dollar. This lowers the strength of the Kenya Shilling as more of the Kenyan currency will be used to import the petroleum products. This increases the cost of bringing the products into the country. Since prices of petroleum products are cost-reflective, the increase in importation costs will transmit in the wholesale and retail prices borne by consumers.

iv) Demographics

The size and distribution of the country's population affects the quantity of petroleum products consumed. Generally, growth in population increases the demand for petroleum products. Consumption of some of the products depends on the distribution of population rather than the aggregate population for the nation. Furthermore, the population distribution into rural versus urban also plays a role in demand for specific petroleum products.

v) Prices of substitute commodities

Substitute commodities are goods that serve similar purposes and can be used in place of one another. A change in the price of one substitute directly affects the demand for the other. For instance, charcoal and LPG are common cooking fuels in many households. When the price of LPG rises, consumers may shift to charcoal as a more cost-effective option, increasing its demand. This inverse relationship in demand is a key characteristic of substitute goods, driven by consumers' efforts to maintain utility while minimizing cost.

vi) Other Base Variables

The demand for specific petroleum products needs to be supported by their respective base variables. This report models the demand for six key products which include PMS, AGO, DPK, fuel oil, Jet A1 and LPG. Thus, in addition to the demographic variables identified above, additional base variables included in the study are as follows: aircraft movements (for the case of jet fuel), vehicle population (for the case of diesel and petrol demand), thermal contribution, and the number of vessel movements (for the case of fuel oil).

3.4 The Empirical Models

In line with literature review, demand model estimations for the selected petroleum products were carried out, with final demand functions for each product specified as follows:

Petrol Demand

$$PETROL\_MNLTRS = 79.0465 - 1.0243 * PRICEP + 0.00004 PETROL\_VEH + 0.6284 * PETROL\_MNLTRS(-1) + 0.00068 * TRANGDP$$

Where:

PETROL_MNLTRS = Petrol consumption (million litres)
PRICEP = Price of petrol (per litre)
PETROL_VEH = Petrol Vehicles population
PETROL_MNLTRS (-1) = Lagged Petrol consumption (million litres)
TRANGDP = Transport GDP

Diesel Demand

$$DIESEL\_MNLTRS = -2.7057 * PRICED - 3.5817 * EXCHR + 0.0462 * POP + 0.6754 * DIESEL\_MNLTRS(-1) + 0.000145 * DIESEL\_VEH - 560.88$$

Where:

DIESEL_MNLTRS = Diesel consumption (million litres)
PRICED = Price of Diesel (per litre)
EXCHR = Nominal exchange rate (Ksh/USD)
POP = Kenyan population in '000s
DIESEL_VEH = Diesel Vehicle Population
DIESEL_MNLTRS (-1) = Diesel consumption lagged by one year (million litres)

Liquefied Petroleum Gas Demand

$$LPG\_TON = -29.7235 - 0.0195PRICELPG + 3.3401PRICE\_CHARCOAL + 0.00043RDGPPC + 0.0075URBANPOP\_000'S + 14.4276LPG\_DUMMY$$

Where:
LPG_TON = Liquefied petroleum gas consumption in tonnes
PRICELPG = Price of Liquefied petroleum gas (Kshs. per 13kg cylinder)
PRICE_CHARCOAL= Price of Charcoal (Kshs. per kg)
$URBANPOP\_{000's}$ = Urban population (in thousands)
RGDPPC = Real GDP per Capita
LPG _DUMMY = LPG 2023 Policy direction

Fuel Oil Demand

$$LOG(FUELOIL\_TON) = -0.08007 * LOG(PRICEFUELOIL) + 0.6215 * LOG(FUELOIL\_TON(-1)) + 0.15841 * LOG(THERMAL\_CONT) + 1.552$$

Where:
FUELOIL_TON = Fuel oil consumption in tonnes
PRICEFUELOIL = Price of Fuel oil
FUELOIL_TON (-1) = Lagged Fuel oil consumption in tonnes
THERMAL_CONT =Thermal Contribution in electricity generation

Jet Fuel

$$LOG(JETFUEL\_MNLTRS) = -0.01472LOG(JETFUELPRICE\_USD\_LITRE(-1)) + 0.0298LOG(NGDPM) + 0.6291LOG(JETFUEL\_MNLTRS(-1)) + 0.1195LOG(AIRCRAFTMOVES) + 0.245$$

Where:
JETFUEL_MNLTRS = Jet fuel consumption in million litres
JETFUELPRICE_USD_LITRE = Price of Jet fuel in USD per litre
NGDPM = Nominal Gross Domestic Product in Millions
AIRCRAFT MOVES = Number of aircraft arrivals and departures

3.5 Definition of Scenarios

The forecast is based on three scenarios: Baseline, Optimistic and Pessimistic scenarios. The expectation in building these scenarios is that each of the parameters will affect or be affected by key variables in the model.

i) Baseline Scenario

This scenario serves as the reference case, with projections derived from historical data trends and anticipated growth across key demand drivers, aligned with the expected performance of the national economy.

ii) Optimistic Scenario

This scenario assumes an accelerated economic growth and development from the baseline.

iii) Pessimistic Scenario

This scenario represents a low growth and development trajectory from the baseline.

3.6 Forecast Assumptions

Several assumptions were made for all the variables in a bid to generate demand forecasts for petroleum products in Kenya up to 2029. The assumptions employed are highlighted from table 31 to table 36.

3.6.1 Premium Motor Spirit (PMS)

Table 3.1: Forecasting assumption for PMS

Category	Data sources	Base Year Assumption (2024)	Projection assumptions
Price (Kshs/ ltr)	EPRA monthly petroleum pump prices press releases	The average price of petrol in 2024 was Ksh191.8 per litre. This was calculated from the monthly published gazette notices for the different towns across Kenya.	Baseline: The 2025 price (Ksh. 180.2) was assumed as the average for Jan-March. This is then grown by 5.33% (average historical growth rate 2016-2021) for the rest of the planning period. Optimistic: The baseline forecast is reduced by 6.32%. Pessimistic: The baseline forecast is increased by 6.32%. 6.32% is a 10-year historical growth rate from 2014 to2024
Petrol vehicles population (number)	KRA (imported vehicle data base)	The total petrol vehicle population was 4,517,096. This is calculated as 87.5% of the total vehicle population. The total vehicle population was 5,162,396 in the base year. This is calculated as 7.87% growth from 2023.	Baseline: The number of petrol vehicles in the base year grown by an average of 7.87% annually. Optimistic: Baseline forecast increased by 7.87% year on year. Pessimistic: Baseline forecast reduced by 7.87% year on year. 7.87% is a 5-year average historic growth in the total vehicle population from 2019 to2023
Transport GDP	KNBS Economic Survey 2024	Transport GDP for the base year was assumed to be Ksh. 1,065,862. This was derived by growing the 2023 GDP by 6.35% being the average growth 2018-2023 excluding 2020.	Baseline: Base year GDP grown 3% (obtained by dividing 18% (2018, 2023) by 6 years. Optimistic: Baseline forecast increased by 3% average for 6 years between 2018 and2023. Pessimistic: Baseline forecast growth rate is decreased by 3%.

3.6.2 Automotive Gas Oil (AGO)

Table 3.2: Forecasting assumption for Automotive Gasoil

Category	Data sources	Base Year Assumption (2024)	Projection assumptions
Price of diesel (Ksh./ltr)	EPRA monthly petroleum pump prices press releases	The average price of diesel in 2024 was Ksh. 178.30 per litre. The average was calculated from the monthly published gazette notices for the different towns across Kenya.	Baseline: The price in 2025 (173.9) was assumed as the average for Jan-March. This is then grown by 7.43% (average annual for 2016-2021) for the rest of the planning period. Optimistic: Baseline price reduced by 6.85% annually. Pessimistic: Baseline price grown by 6.85% annually. 6.85% is a 10-year historical growth rate from 2014 to2024

Category	Data sources	Base Year Assumption (2024)	Projection assumptions
Exchange rate	KNBS Leading Economic Indicators LEIs, Central Bank of Kenya (CBK)	The average nominal exchange rate for the year 2024 was Ksh. 134.82. The average was calculated from KNBS (LEI) & CBK for 2024.	Baseline: The exchange rate in the base year grown by an average of 3.75% annually. Optimistic: Baseline exchange rate reduced by 3.75% year on year. Pessimistic: Baseline exchange rate increased by 3.75% year on year. 3.75% is a 10-year average historic growth 2015-2024.
Population Growth Rate	UN-WPP 2024/ KNBS (Kenya Population and Housing Census Summary Report on Kenya's Population Projections 2019)	The base year population was assumed to be 52,428,290. This is based on the KNBS Population Projections.	Baseline: Adopted the UN medium variant projections in population growth rates. Optimistic: Adopted UN Low Variant projections in population growth rates. Pessimistic: Adopted UN high variant projections in population growth rates.
Diesel Vehicle Population Growth Rate	KRA (imported vehicles data base)	The total petrol vehicle population was 645,299. This is calculated as 12.5% of the total vehicle population. The total vehicle population was 5,162,396 in the base year. This is calculated as 7.87% growth from 2023.	Baseline: The number of petrol vehicles in the base year grown by an average of 7.87% annually. Optimistic: Baseline forecast increased by 7.87% year on year. Pessimistic: Baseline forecast reduced by 7.87% year on year. 7.87% is a 5-year average historic growth in the total vehicle population 2019-2023.

3.6.3 Illuminating Kerosene (IK)

Table 3.3: Forecasting assumption for IK

Category	Data sources	Base Year Assumption (2024)	Projection assumptions
Kerosene Demand	Historical Trend from KNBS Economic Surveys (2005-2024)	The total consumption of kerosene was 47.2 million litres in 2024.	Baseline: 4.57% decline from the base year (20 years' historical average growth rate) Optimistic: Baseline growth rate reduced by 15.66% (10 years' historical average growth rate) Pessimistic: Baseline growth rate increased by 15.66% (10 years' historical average growth rate)

3.6.4 Liquefied Petroleum Gas (LPG)

Table 3.4: Forecasting assumptions for LPG

Category	Data sources	Base Year Assumption (2024)	Projection assumptions
Price of LPG (Ksh./13kg cylinder)	KNBS LEIs 2024	The average price of LPG in 2024 was Ksh. 3,188 per 13kg cylinder. The price was derived from the monthly published LEIs	Baseline: The price of LPG in 2025 is assumed to be Ksh. 3122.16 being the actual price for January 2025. Thereafter, an average growth rate of 10.05% is adopted for the rest of the planning period. Optimistic: Baseline forecast reduced by 10.05% annually (5 years average historical growth from 2020 to2024) Pessimistic: Baseline forecast grown by 1.24% annually (10 years average historical growth from 2015 to2024)

Category	Data sources	Base Year Assumption (2024)	Projection assumptions
Price of Charcoal	KNBS Leading Economic Indicators (LEI) 2024	The average price of charcoal was assumed to be Kshs 82.3 per kg in the base. The price was derived from the monthly published Leading Economic Indicators (LEI)	Baseline: Base year price grown by 10.44% annually being a 5-year average historic growth 2019-2024. Optimistic: Baseline forecast increased by 5.22% year on year. Pessimistic: Baseline forecast reduced by 5.22% year on year. 5.22% is derived as the half of the 5-year historic average of 10.44% (2019 to 2024).
Urban Population	KNBS (Kenya Population and Housing Census Summary Report on Kenya's Population Projections 2019)	The urban population in thousands was assumed to be 16,348,182 being 31.18% of the total Population (52,428,290). This is based on KNBS population projections.	A constant share of urban population (31.18%) maintained over the three scenarios and over the planning period. Population projections vary based on the UN world population prospectus where: Baseline: Adopted the UN medium variant projections in population growth rates. Optimistic: Adopted UN Low Variant projections in population growth rates. Pessimistic: Adopted UN high variant projections in population growth rates.
Real GDP per capita (Billion)	KNBS Q1-Q3 Quarterly GDP reports 2024	The real GDP in the base year assumed to be Ksh. 10,871 billion. This is obtained by growing 2023 GDP by 4.35%. 4.35% is the average quarterly GDP for Q1, Q2 and Q3 in 2024.	Baseline: Projections based on the Kenya Budget Policy Statement 2025 forecast. Optimistic: GDP growth Projections based on MTP IV (2023 – 2027) forecast. Pessimistic: Projections based on the average historical deviation between MTP III (2018 to 2022) projections and the actual recorded GDP based on KNBS Economic Survey reports.
LPG_DUMMY (Policy direction)	LPG growth Strategy 2023	LPG policy dummy introduced in the base year to capture government's concerted efforts to stimulate LPG demand. The dummy is 1 if the policy applies and 0 when the policy is no longer applied.	LPG dummy set to 1 across the three scenarios over the planning period. The assumption being that the LPG growth strategy will be in application over the planning horizon.

3.6.5 Fuel oil

Table 3.5: Forecasting assumptions for Fuel Oil

Category	Data sources	Base Year Assumption (2024)	Projection assumptions
Price of fuel oil	Calculated based on the trend in the growth of diesel prices.	The price of fuel oil estimated to be 101,599 Ksh./ton. This is obtained by reducing the 2023 price of fuel oil by the average growth rate of 1.11%. This is the percentage decline in price of diesel between 2024 and 2023. Price of diesel and fuel oil was found to be correlated at 97% between 1980 and 2014. 2014 is the last year KNBS published the price of fuel oil.	Baseline: The price for 2025 obtained by reducing the base year price by 2.48%. This is the decline in the growth of diesel price between 2024 and 2025. An average growth rate of 7.43% was adopted for the rest of the planning period. This is the average growth rate of diesel prices from 2016 to2021. Optimistic: Baseline forecast is reduced by 5.35% year on year. Pessimistic: Baseline forecast is increased by 5.35% year on year. 5.35% is the average 10-year historic growth from 2014 to2024.

Thermal Contribution	LCPDP (2024-2043) EPRA Evolution of Generated Energy Mix 2024	The average thermal contribution was 8% in 2024. The average thermal contribution was calculated from the actual energy mix for 2024.	For all scenarios, thermal power plants will be faced out by 2035. Baseline: Thermal contribution will decline from 8.23% in 2025 to 0 in 2036. Optimistic: Thermal contribution will decline from 8.27% in 2025 to 0 in 2036. Pessimistic: Thermal contribution will decline from 8.19% in 2025 to 0 in 2036.

3.6.6 Jet fuel

Table 3.6: Forecasting assumptions for Jet Fuel

Category	Data sources	Base Year Assumption (2024)	Projection assumptions
Price of Jet fuel	IndexMundi	The average price of jet fuel in 2024 was $0.6 per litre.	Baseline: The base year price was grown by 10.43% over the planning period. Optimistic: Baseline price reduced by 10.43% year on year. Pessimistic: Baseline price increased by 10.43% year on year. 10.43% is derived as a 8 year historical average from 2016 to2023
Nominal GDP	Budget Policy Statement (BPS) 2025, MTP IV, Vision 2030	The nominal GDP in the base year assumed to be Ksh. 15,793 billion. This is obtained by growing 2023 nominal GDP by 4.35%. 4.35% is the average quarterly GDP for Q1, Q2 and Q3 in 2024.	Baseline: Projections based on the Kenya Budget Policy Statement 2025 forecast. Optimistic: GDP growth Projections based on MTP IV (2023 – 2027) forecast. Pessimistic: Projections based on the average historical deviation between MTP III (2018 to 2022) projections and the actual recorded GDP based on KNBS Economic Survey reports.
Aircraft movements	KNBS (Economic Survey 2024) /Kenya Civil Aviation Authority (KCAA) (Master Plan 2015-2030)	The number of aircraft movements in the base year is assumed to be 304,615. This is obtained as a 3.85% growth from 2023. 3.85% is the average growth between 2018 and2023 except the covid year	Baseline: The growth rate in aircraft movements was computed as the average of the optimistic and pessimistic growth rate estimates. Optimistic: Target is to reach 380,000 number of aircraft movements by 2030 (KCAA Master Plan 2015-2030). Pessimistic: Base year number grown by 2.59% being a 5-year historical average growth rate of aircraft movements from 2019 to2023.

4. Results of the Forecast

4.1 Introduction

This section presents the forecast results for petroleum products, for the medium-term period from 2024 to 2029. The forecasting considered three scenarios: Baseline, Optimistic and Pessimistic scenarios. The petroleum products considered in the forecast are PMS, AGO, IK, LPG, fuel oil and jet fuel.

4.2 Results

4.2.1 Petrol Demand

In the medium term, PMS demand is projected to grow at an average annual rate of 3.35%, 4.08% and 2.97% under the baseline, optimistic and pessimistic scenarios respectively as reflected in Figure 4.1. However, due to the upcoming general elections in 2027, petrol demand is forecasted to grow at a declining rate because of anticipated reduced movements during this period.

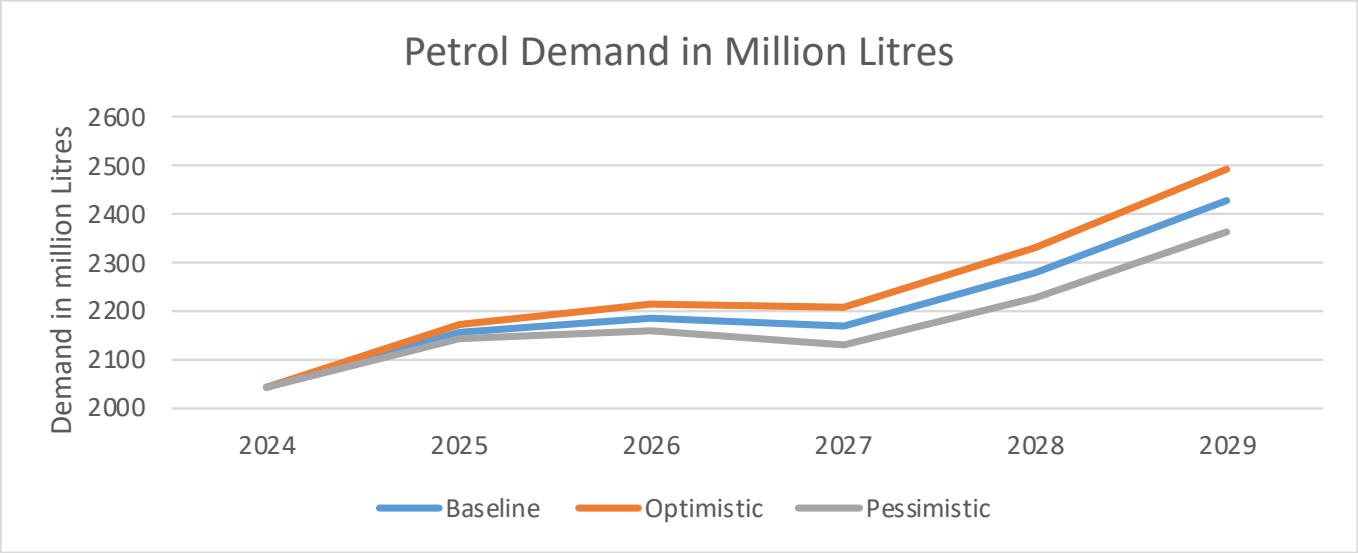

Figure 4.1: Petrol Demand projection by Scenarios

The growth in PMS demand is attributed to expected growth in vehicle population by an average annual rate of 7.87%, 8.49% and 7.25% under the baseline, optimistic and pessimistic scenarios respectively. Additionally, GDP expands by an annual average of 5.36%, 7.48% and 5.24% under the baseline, optimistic and pessimistic scenarios respectively. The projections are further driven by possible increased importation of petrol-based internal combustion engines vehicles into the Kenyan market from advanced economies following their faster transition to e-mobility compared to Kenya.

4.2.2 Diesel Demand

The demand for diesel is projected to grow within the 5-year forecast period at 3.52%, 4.28%, and 2.74% in the baseline, optimistic, and pessimistic scenarios, respectively as shown in Figure 4.2.

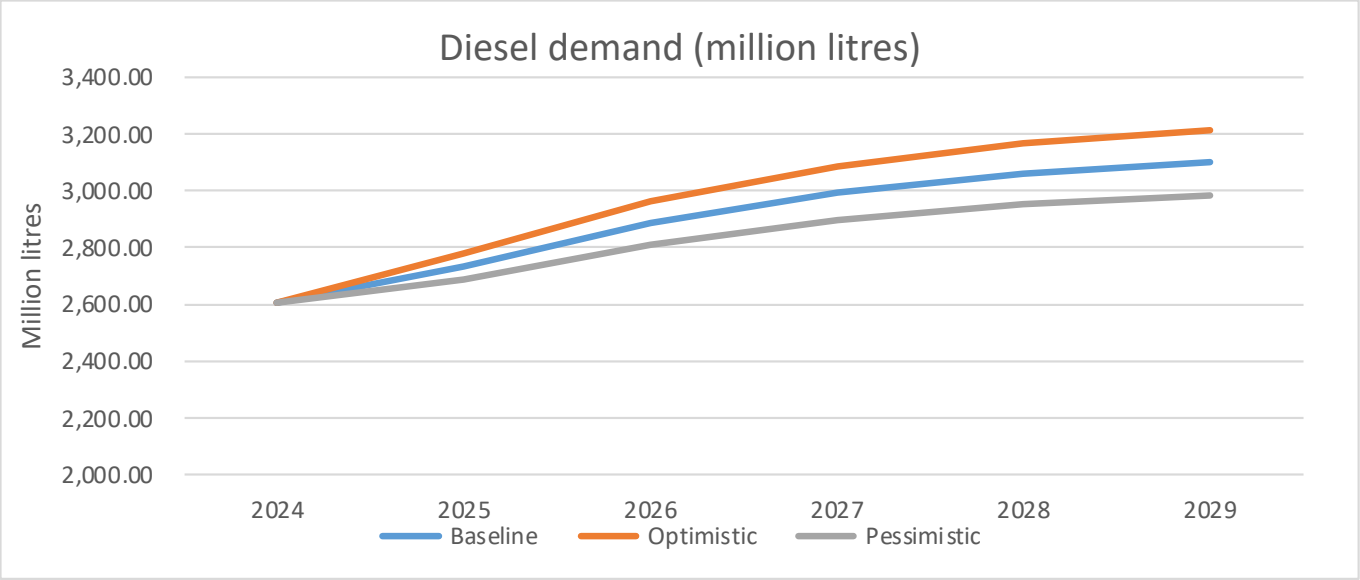

Figure 4.2: Diesel Demand projection by Scenarios

In the medium term, diesel demand grows at a declining rate from 4.74% in 2025 to 1.39% in 2029. The growth is attributed to the increase in population and an increase in the average growth rate of the diesel vehicle population. There exists a possibility of dumping diesel powered vehicles (i.e. compressed ignition engines) from the advanced economies following their faster transition to e-mobility compared to Kenya, despite the carbon emission reduction campaigns by advanced economies which have also resulted in a slow shift towards e-mobility in the Kenyan market.

4.2.3 LPG Demand

In the medium term, LPG demand is projected to grow at an average annual rate of 7.26%, 8.82% and 6.34% for the baseline, optimistic and pessimistic scenarios respectively as reflected in Figure 4.3.

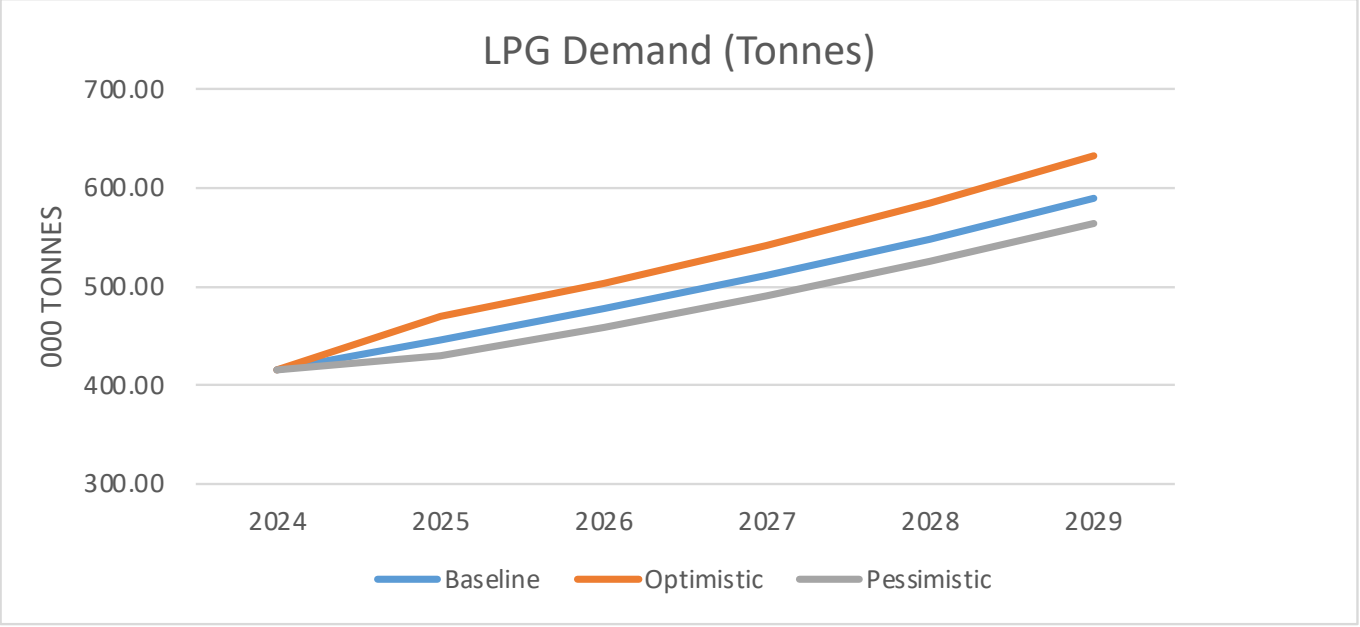

Figure 4.3: LPG Demand projection by Scenarios

The growth in LPG demand is attributed to a projected growth in urban population, an average of 1.91%, 1.70% and 2.11% in the baseline, optimistic and pessimistic scenarios, respectively. Due to fuel switching, the demand for LPG is expected to rise as the price of charcoal is projected to increase at an annual average rate of 10.44%. The National LPG Strategy 2023 forecasts an annual increase in LPG demand by a factor of 14.4%. However, the LPG price is projected to decline by a factor of 0.02% annually, which will effectively increase the overall annual demand for LPG.

4.2.4 Kerosene Demand

Under all the three scenarios, Kerosene demand is anticipated to contract over the forecast period, as illustrated in Figure 4.4.

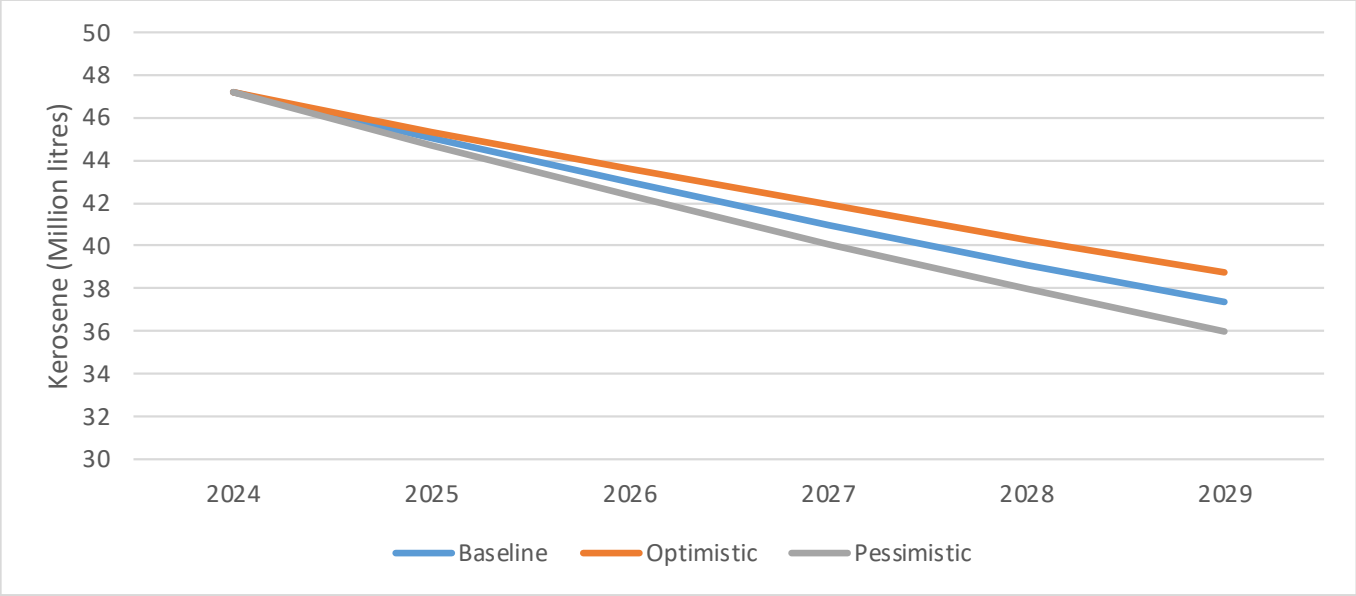

Figure 4.4: Kerosene Demand projections by Scenarios

The average annual contracting rate on Kerosene during the period under review will be 4.57%, 3.86%, and 5.29%, while the volumes reach 37.33, 38.75, and 35.95 million litres along the Baseline, Optimistic, and pessimistic scenarios respectively. The decline is attributed to the deliberate effort made by the government to increase the uptake of other cheaper alternatives like solar lighting, LPG, alternative cooking fuels such as biogas and bioethanol.

4.2.5 Jet fuel Demand

Results of the forecast show that in the baseline scenario the demand grows at an average annual rate of 1.87% from 999.48 million litres in 2025 to 1,067.33 million litres in 2029. In the optimistic scenario, there is a marginal increase in the growth rate of Jet fuel demand as compared to baseline scenario averaging 2.17% over the planning period.

In the pessimistic scenario, the demand is expected to grow at an annual average rate of 1.70% to reach 1056.78 million litres in the year 2029 as shown in Figure 4.5.

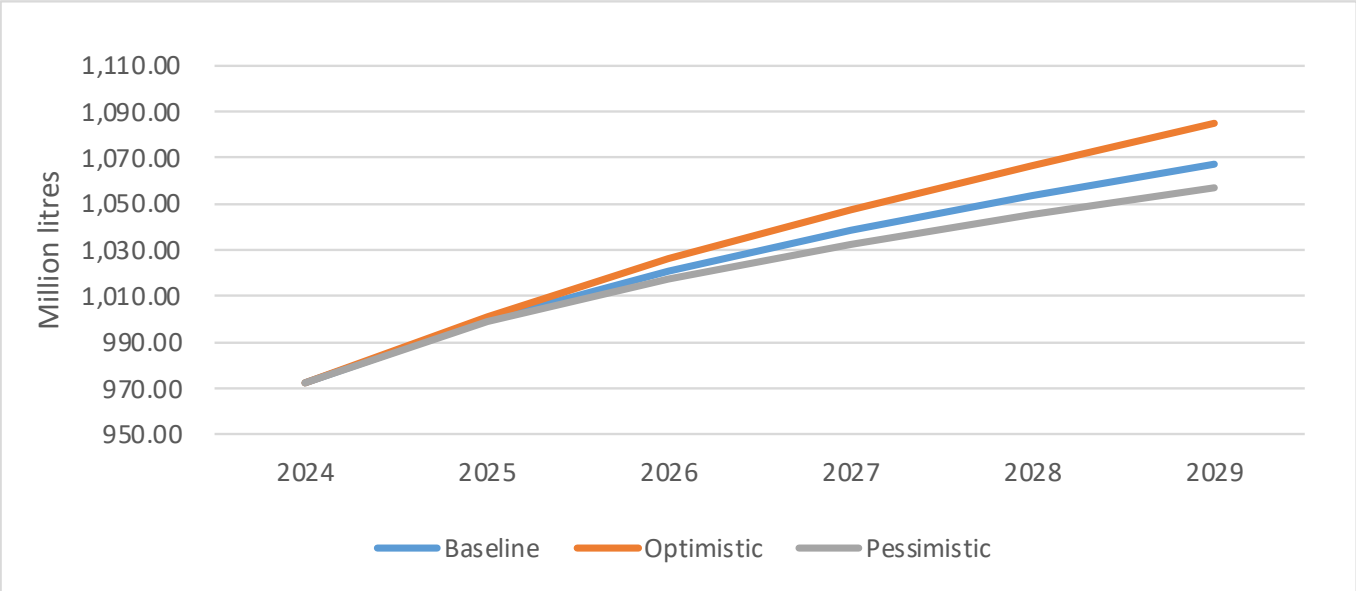

Figure 4.5: Jet fuel Demand projections by Scenarios

The results however show a gradual increase in demand in all the scenarios for jet within the forecast period. The increase is largely attributed to increased aircraft movements over the period driven by the increased air passenger movements. KCAA targets to increase both domestic and international aircraft movements to 380,000 by 2030.

4.2.6 Fuel Oil Demand

Results of the forecast show that fuel oil demand is expected to grow at an increasing rate from 2024 up to 2026, after which the demand declines as illustrated in Figure 46.

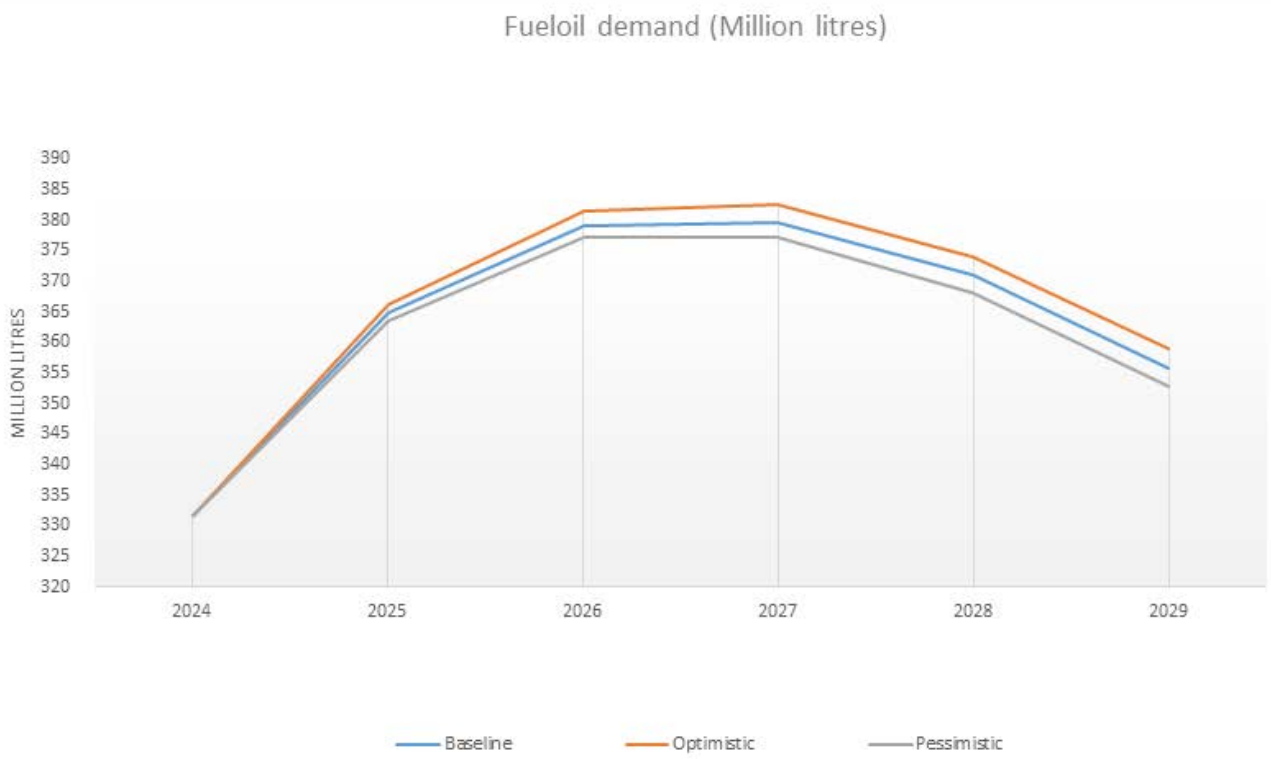

Figure 4.6: Fuel oil Demand projections by Scenarios

In the baseline scenario, demand grows at an average growth rate of 4.68% from 2024 to 2027, after which, it declines by an average rate of 3.19% to 2029. In the optimistic scenario, the demand is expected to grow at an average growth rate of 4.95% from 2024 to 2027, after which, it declines by an average rate of 3.13% to 2029. In the pessimistic scenario, the demand is expected to grow at an average growth rate of 4.44% from 2024 to 2027, after which, it declines by an average rate of 3.26% to 2029.

The trend observed in the fuel oil demand curve across the three scenarios is primarily driven by changes in the share of thermal power in electricity generation. According to the National Long-Term Low Emission Development Strategy 2022–2050, deliberate efforts are underway to achieve a 32% reduction in greenhouse gas emissions by 2030. Within the electricity supply sector, this target will be supported by the decommissioning of fossil-fuel-based thermal generation. Consequently, as thermal generation declines, the demand for fuel oil is projected to decrease steadily, particularly leading up to 2035—the year when the last thermal power purchase agreement (PPA) is set to expire. This trend explains the noticeable drop in fuel oil demand beginning after 2028.

4.2.7 Total Domestic Demand

The total domestic demand for petroleum products within the three scenarios is expected to grow across all products considered in this forecast except for the illuminating kerosene as shown respectively in Table 41, Table 42 and Table 43.

Economic development and rising GDP per capita may spur greater industrial activity and demand for energy, including petroleum-derived products for manufacturing processes. As Kenya continues to develop its infrastructure and expand its economy, there could be increased demand for petroleum products in construction, agriculture and other sectors. Finally, despite efforts to promote renewable energy sources, the lack of widespread alternatives and infrastructure may mean that petroleum remains the primary source of energy in Kenya for the foreseeable future, further driving up its domestic demand.

Table 4.1: Total Domestic demand projection - baseline scenario

Commodity	Petrol	Diesel	Kerosene	Jet Fuel	Fuel Oil	LPG
Year	Million ltrs	Million ltrs	Million ltrs	Million ltrs	Million ltrs	000' tonnes
2024	2,044.11	2,608.20	47.17	972.49	331.76	414.86
2025	2,156.97	2,731.85	45.02	999.48	364.92	446.19
2026	2,186.32	2,887.32	42.96	1,020.73	379.20	477.27
2027	2,169.11	2,991.75	40.99	1,038.30	379.74	511.27
2028	2,279.25	3,059.18	39.12	1,053.54	370.92	548.41
2029	2,426.86	3,098.72	37.33	1,067.33	355.84	588.99
Total	13,262.61	17,377.02	252.59	6,151.87	2,182.39	2,986.99

Table 4.2: Total domestic demand projection - Optimistic scenario

Commodity	Petrol	Diesel	Kerosene	Jet Fuel	Fuel Oil	LPG
Year	Million ltrs	Million ltrs	Million ltrs	Million ltrs	Million ltrs	000' tonnes
2024	2,044.11	2,608.20	47.17	972.49	331.76	414.86
2025	2,171.25	2,778.36	45.35	1,000.99	366.80	469.16
2026	2,213.26	2,963.84	43.60	1,026.00	382.37	503.78
2027	2,208.21	3,087.31	41.92	1,047.29	383.67	542.07
2028	2,330.81	3,166.59	40.31	1,066.48	375.22	584.74
2029	2,491.75	3,213.36	38.75	1,084.69	360.24	632.50
Total	13,459.39	17,817.66	257.11	6,197.94	2,200.06	3,147.11

Table 4.3: Total domestic demand projection- pessimistic scenario

Commodity	Petrol	Diesel	Kerosene	Jet Fuel	Fuel Oil	LPG
Year	Million ltrs	Million ltrs	Million ltrs	Million ltrs	Million ltrs	000' tonnes
2024	2044.11	2,608.20	47.17	972.49	331.76	414.86
2025	2142.68	2,685.33	44.68	998.93	363.14	429.54
2026	2159.40	2,810.80	42.32	1,017.60	376.20	458.84
2027	2130.08	2,896.22	40.08	1,032.74	376.03	490.87
2028	2227.89	2,951.85	37.96	1,045.65	366.86	525.83
2029	2362.36	2,984.25	35.95	1,057.14	351.68	563.99
Total	13,066.52	16,936.65	248.15	6,124.55	2,165.66	2,883.94

4.3 Current versus previous projections

The current projections (2025) are based on actual data for the period 1980-2024 The previous projections (2024) were based on actual data for the period 1980-2023. As presented in Table 44, the comparison between the two forecasts indicates a decrease in the total projections in the 2025 model from the 2024 model. The variation can be explained by the fact that the re-estimated equations for 2024 involved inclusion of more relevant variables. Similarly, the current model makes use of more data points with more recent data. In addition, the 2025 projection makes use of revised assumptions that reflect recent trends in the explanatory variables.

Table 4.4: Projections as of 2025 versus 2024 forecast

2025 Forecast							
Years	2023	2024	2025	2026	2027	2028	2029
Petrol	1,446.4	1,472.7	1,554.0	1,575.2	1,562.8	1,642.1	1,748.5
Diesel	2,186.9	2,193.6	2,297.6	2,428.4	2,516.2	2,572.9	2,606.2
LPG	365.2	414.9	446.2	477.3	511.3	548.4	589.0
Kerosene	55.0	37.1	9.2	14.8	26.9	36.9	46.8
Jetfuel	746.6	765.1	786.4	803.1	816.9	828.9	839.8

Fueloil	377.0	301.9	332.1	345.0	345.5	337.5	323.8
TOTAL	5,177.1	5,185.3	5,425.5	5,643.8	5,779.5	5,966.7	6,153.9
2024 Forecast							
Years	2023	2024	2025	2026	2027	2028	2029
Petrol	1,446.4	1,937.7	2,098.4	2,247.2	2,388.2	2,543.0	2,710.3
Diesel	2,186.9	2,324.5	2,528.6	2,673.3	2,828.8	2,991.9	3,166.3
LPG	365.2	377.8	390.9	405.7	421.3	437.8	455.4
Kerosene	55.0	48.9	44.9	41.3	37.9	34.9	32.0
Jetfuel	746.6	665.0	673.1	687.7	698.5	708.1	717.3
Fueloil	377.0	333.7	342.1	372.4	401.3	425.1	448.7
TOTAL	5,177.1	5,687.6	6,078.1	6,427.6	6,776.0	7,140.9	7,530.0

Source: EPRA Petroleum Demand Forecasting Models (2024, 2025), measured in tonnes

5. PETROLEUM INFRASTRUCTURE

The petroleum sector plays a pivotal role in both the local and regional economy, driving industrial growth and energy security. Ensuring a resilient and efficient infrastructure is essential to sustaining the petroleum supply chain from importation terminal to primary storage through distribution infrastructure, to secondary storage and eventual distribution to end-users. Robust infrastructure safeguards the security of supply by supporting critical operations that are vital to Kenyan economy and the broader East African region. This chapter provides a comprehensive analysis of Kenya's petroleum infrastructure, covering existing assets, planned developments, and the strategic implementation roadmap to enhance efficiency, reliability, and regional integration.

5.1 Existing Infrastructure

The existing infrastructure includes receiving terminals, storage depots, pipelines, and loading facilities that support the transportation and distribution of petroleum products.

5.1.1 Jetties

Jetties are crucial marine infrastructure designed to facilitate the berthing of ships and the efficient transfer of petroleum products between sea vessels and onshore storage facilities. Serving as critical entry points in the petroleum supply chain, jetties enable the safe and controlled receipt of bulk fuel imports, which are then distributed to various storage depots across the country. Currently, there are four (4) Jetties handling petroleum products.

i) **Kipevu Oil Terminal 1 (KOT 1):** Commissioned in 1968, this was Kenya's primary import facility until 2022. Decommissioning of the facility was completed in 2025.

ii) **Kipevu Oil Terminal 2 (KOT 2):** The jetty consists of four berths, each with dedicated lines for AGO, PMS, DPK, HFO/ Crude, and LPG. The terminal is connected to key storage facilities: KPRL, KOSF, SOT terminals, and VTTI.

iii) **Shimanzi Oil Terminal** (**SOT**): The jetty is a critical component of Kenya's petroleum import infrastructure. The jetty is limited to handling Liquefied Petroleum Gas (LPG) and Heavy Fuel Oil (HFO). The terminal is connected to KPRL and SOT terminals.

iv) **Africa Gas and Oil Limited (AGOL):** The AGOL jetty is a privately owned LPG handling facility. The terminal is connected to AGOL LPG storage facility, which features extensive storage, and loading capacity, ensuring a steady supply of LPG for both domestic and regional markets.

v) **Kisumu Oil Jetty (KOJ):** This facility was commissioned in 2018 to provide alternative supply route for East African Region and reduce reliance on Road transport. The facility is designed to load 2 barges of length of up to 70m at a time.

Table 5.1 shows the existing jetty infrastructure in Kenya.

Table 5.1: Existing Jetties

Import Handling Facilities	No. of Berths	Product type	Operational capacity (Flowrate)	Remarks
KOT 2	4	AGO	AGO - 4,500m3/hr	3 berths currently operational Serves KPRL, KOSF, SOT and VTTI
		PMS	PMS - 4,000m3/hr	
		DPK	DPK - 4,500m3/hr	
		HFO	HFO - 4,500m3/hr	

Import Handling Facilities	No. of Berths	Product type	Operational capacity (Flowrate)	Remarks
		LPG	LPG - 2,500m3/hr	
SOT	1	LPG	LPG - 35-40 ton/hr	SOT terminals no longer handle white products unless during back loadings
		HFO	HFO - 400-450 m3/hr	
		PMS &AGO	PMS/AGO - 200-250m3/hr	
KOJ	1	PMS	500M3/hr	This is a very key investment in unlocking new demand in Uganda, Rwanda, Burundi, East DRC and South Sudan.
		AGO	500M3/hr	
		Jet A1	500M3/hr	
		IK	500M3/hr	
AGOL	1	LPG	300 Mt/hr	Private but critical terminal for LPG handling.
M b a r a k i wharf	1	HFO & Bitumen	600m3/hr	Private facility capable of handling dry bulk cargo like cement, clinker and fluorspar as well as wet cargo such as HFO, Bitumen, and Diesel.

5.1.2 Storage facilities

Storage facilities are strategically located in various regions for the purpose of maintaining buffer stocks, stabilizing supply and meeting fluctuating demand. The storage facilities are classified into primary and secondary storage and are equipped with storage tanks and truck loading infrastructure designed for efficient regional distribution. Storage depots can operate as private facilities or as common use facility as shown in Table 5.2.

Table 5.2: Existing storage facilities

Location	Facilities	Product Type	Net Tank capacity
Mombasa	Primary Storage Facilities		M3
	KOSF (PS14) – Common user	PMS	91,173
		AGO	81,029
		JET	108,374
	KPRL (PS15) – Common user	PMS	114,337
		AGO	133,816
		JET	22,794
	Vivo Energy - Private	PMS	24,323
		AGO	42,714
		DPK	4,600
		HFO	30,000
	VTTI - Private	AGO	111,057
	GAPCO - Private	PMS	36,000
		AGO	38,000
		IK	6,000
		HFO	25,000
	Ola Energy Kenya Limited - Private	PMS	5,600
		AGO	19,490
		IK	4,438
		HFO	25,215
	Mombasa Joint Terminal (MJT) - Private	PMS	2,585
		AGO	18,028
		IK	8,485
		HFO	35,643

Location	Facilities	Product Type	Net Tank capacity
	KENGEN- Private	HFO	18,000
	MBTL - Private	HFO	46,000
		Bitumen	6,000
	Tecaflex (Ex-Mbaraki) - Private	HFO	15,00
	Secondary Storage		
	MIA (PS12) – Common user	JET	7,349
KONZA	Petrocity Energy) - Private	PMS	28,000
		AGO	40,000
		IK	4,000
Nairobi	JKIA (PS09) – Common user	JET	48,000
	Nairobi (PS10) – Common user	PMS	89,935
		AGO	98,582
		IK	8,030
		JET	9,149
	Vivo Energy Kenya Limited) - Private	PMS	5,100
		AGO	10,300
		IK	700
	Lake Oil Limited) - Private	PMS	675
		AGO	675
		IK	675
	Ola Energy Kenya Limited) - Private	PMS	1,475
		AGO	2,650
		IK	236
		HFO	236
	Rubis NJD) - Private	PMS	1,700
		AGO	5,100
		IK	800
		HFO	170
	National Oil Corporation of Kenya) - Private	PMS	750
		AGO	3,100
		IK	500
	Oilcom Limited) - Private	PMS	1,461
		AGO	4,028
		IK	753
		HFO	347
	Gulf Energy Holdings Limited- Private	PMS	1,200
		AGO	1,200
		IK	500
Nakuru	Nakuru (PS25) – Common user	PMS	9,526
		AGO	14,848
		IK	2,480
Eldoret	Eldoret (PS27) – Common user	PMS	12,260
		AGO	20,000
		IK	4,146
		JET	5,655
Kisumu	Kisumu (PS28) – Common user	PMS	10,900
		AGO	18,186
		IK	4,738
		JET	5,419

5.1.3 LPG Storage Infrastructure

The demand for LPG into the country is met by import from refineries in Asia, Middle East, Americas and Western Europe. The product is imported privately through Mombasa and a small quantity through Dar-es-salaam via Namanga or Loitoktok or Taita Taveta or Lunga Lunga border crossing points.

At Mombasa, there are two main LPG receiving terminals (jetties), namely, AGOL and SOT. KOT 2 has an LPG berth and offloading equipment complete with a marine pipeline connecting the jetty to the Common-User Manifold (CUM). However, there is no onshore pipeline connecting the existing LPG storage facilities to the CUM. The proposed 30,000 MT LPG PPP project at KPRL, Changamwe will include construction of an 18-inch pipeline.

Currently, LPG is evacuated from existing storage facilities to inland areas using road tankers. However, railway transport remains the safest and most cost-effective mode for inland LPG transportation. At present, only Total (Changamwe and Shimanzi), Vivo, Ola, and KPRL facilities are connected to the existing meter-gauge railway network and have operational rail sidings for loading. Rail-based LPG transport was suspended following an accident in August 2000. According to EPRA's licence register, Kenya has approximately 660 LPG road tankers facilitating this evacuation. To enhance LPG distribution efficiency, it is proposed that a 10,000 metric-tonne secondary storage facility be developed in Nairobi, with railway siding access. Additionally, 1,000 to 5,000 metric-tonne storage facilities could be considered for Kisumu and Eldoret to serve nearby regions in the near term.

According to a 2005 LPG infrastructure study[1], it was proposed that there should be bulk distribution centres at Nairobi, Sagana, Kisumu, Eldoret and Nakuru because they are served by railway system. However, the petroleum cost of service study report[2] (COSSOP II) recommended 24 mini-bulk LPG depots in the following main towns to be supplied by LPG road tankers: Mombasa, Malindi, Lamu, Voi, Garissa, Wajir, Mandera, Marsabit, Machakos, Kitui, Nairobi, Sagana, Meru, Nanyuki, Nakuru, Nyahururu, Eldoret, Kitale, Bungoma, Kericho, Kisii, Migori, Lodwar, Kisumu. Table 5.3 shows the existing LPG storage infrastructure.

Table 5.3: LPG Storage Infrastructure

Facility	Capacity	Remarks
KPRL	1200 MT	KPRL receives LPG through SOT
AGOL	25000MT	AGOL and Lake Gas have their own jetties.
Lake Gas	10,000 MT	Lake Gas facility is expected to be commissioned by June 2025.
SOT Terminals	650 MT	KOT2 to replace SOT for LPG receipts.
Evacuation		
KPRL	KPRL Truck loading capacity (2 loading bays) – 50MT/hr	Estimated Number of LPG trucks – 665 of average capacity 23MT per truck.
AGOL	AGOL Truck loading capacity (8 loading bays) – 200 MT/hr.	
Lake gas	Lake gas Truck loading capacity (4 loading bays) - 100 MT/hr	

1 "Consultancy Services for the Study of Liquefied Petroleum Gas (LPG) Demand In Kenya and the East African Region and Undertake a Preliminary Design of needed Infrastructure within Kenya to Meet the Demand" A report for the Ministry of Energy (2005) by the Petroleum Development Consultants Ltd, 63 Highgate High Street, London N6 5JX, United Kingdom.

2 "Consultancy Services to Undertake a Cost of Service Study in the Supply of Petroleum Products in Kenya" A report for the Energy and Petroleum Regulatory Authority (2024) by Kurrent Technologies Ltd (P.O. Box 16989–00620, Nairobi, www.kurrent.co.ke) in association with Channoil Consulting Ltd (20 St Dunstan's Hill, London, EC3R 8HL, United Kingdom, www.channoilenergy.com)

Table 5.4 shows the storage capacity of hinterland LPG facilities by county.

Table 5.4: Summary of LPG Hinterland storage

County	Capacity (Mt)
Nairobi	3,214.90
Kiambu	578.50
Machakos	385.50
Uasin gishu	295.00
Nakuru	290.50
Kisumu	233.00
Muranga	197.00
Kilifi	185.00
Laikipia	180.00
Kisii	178.50
Kajiado	120.50
Nyeri	112.50
Transnzoia	80.00
Busia	66.00
Garissa	61.00
Meru	55.50
Kitui	50.00
Isiolo	48.00
Kirinyaga	44.00
Narok	37.00
Embu	32.00
Nandi	30.00
Bomet	30.00
Bungoma	28.00
Wajir	24.00
Thika	22.00
Marsabit	21.00
Nyandarua	10.00
Kakamega	10.00
Total	6,619.40

5.1.4 HFO Storage Infrastructure

HFO is received into the country through the SOT and Mbaraki warf. The KOT-2 jetty has a provision for dual purpose HFO/ Crude Oil pipeline running from the island jetty to the Beach Valve Station (BVS). Thereafter, the pipeline separates into HFO and Crude Oil and both terminate at KPRL Port Reitz tank farm. The HFO pipeline is not connected to any tank. The bulk of HFO imported into the country is used for power generation. A smaller portion is sold as marine fuel, while the remainder is supplied to industries for thermal heating. Table 5.5 gives a list of HFO storage facilities.

Table 5.5: HFO Storage facility

Facility	Capacity m3	Remarks
KPRL	20,135m3	One tank requires maintenance, and this will increase capacity to 35,000 m3
VIVO	18,400m3	Served by a 10-inch pipeline
OLA	15,000m3	Served by a 10-inch pipeline
GAPCO	10,800m3	Served by a 12-inch pipeline
KENGEN	18,000 m3	Served by a 12-inch pipeline
MBARAKI	30000m3	Ex Mbaraki wharf

TECAFLEX	15000m3	Ex Mbaraki wharf
Bulk Storage Terminal Limited (BSTL)	14,514 m³	Ex Mbaraki wharf
MJT SHIMANZI	20,000m3	Served by a 10-inch pipeline

5.1.5 Pipelines

Kenya has a pipeline network running from Mombasa to Nairobi, Nakuru, Eldoret and operated by KPC. The pipeline is multiproduct line and designed to handle different grades of petroleum products. Product scheduling is done based on the demand requirements. Maintenance for the pipeline facilities and equipment are undertaken as planned and upgrades done periodically to meet demand. The details of the network are tabulated in Table 5.6.

Table 5.6: Existing Pipelines

Pipeline Segments	Distance (KM)	Flow Rate (m3/hr)	Maximum Throughput p.a (m3) @ 95%	Remarks
Mombasa - Nairobi (Line 5)	450	1,200	9,986,400	Upgrade line 5 to cater for region projected demand by 2030 Flow rate upgrade along line 5 to cater for increased demand.
Sinendet-Kisumu (Line 6)	121	290	2,413,380	Upgrade to cope with projected demand.
Mombasa – Nairobi (Line 1)	450	Retired in 2022	Use the wayleave to build line 7 in anticipation of increased demand.	
Nairobi - Eldoret (Line 2)	325	220	1,830,840	Line operating at its maximum utilization capacity.
Sinendet - Kisumu (Line 3)	121	110	915,420	Line operating at its maximum utilization capacity.
Nairobi - Eldoret (Line 4)	325	510	4,244,220	Upgrade to cope with projected demand.

5.2 Demand – Supply Balance

5.2.1 White Fuels Demand-Supply Balance

As at March 2025, the available storage capacity of petroleum products in licensed facilities was a total of 1,688.5 million litres broken down in Table 5.7 below:

Table 5.7: Available Storage Capacity

Petroleum product	Capacity ('000,000 ltrs)
Premium Motor Spirit	462.60
Automotive Gas Oil	755.04
Illuminating Kerosene	52.77
JET A1	231.84
Fuel oil	186.25
Total	1,688.5

The total national demand for white liquid fuels (except LPG & fuel oil) as shown in Figure 51 is expected to grow gradually from 5,933 million litres in 2025 to 6,630 million litres in 2029 averaging at a 3.18% growth rate annually.

In evaluating the country's demand-supply balance, a 30-day total stock cover was established, comprising 15 days of minimum operational stock and 15 days of strategic reserves. This gives a reflection of planned supply which is expected to grow from 6,420 million litres in 2025 to 7,175 million litres in 2029. By providing infrastructure that meets these requirements, the country can avoid supply chain disruptions and hence enhance energy security.

Figure 5.1 provides a comparative analysis of the forecasted demand against planned supply

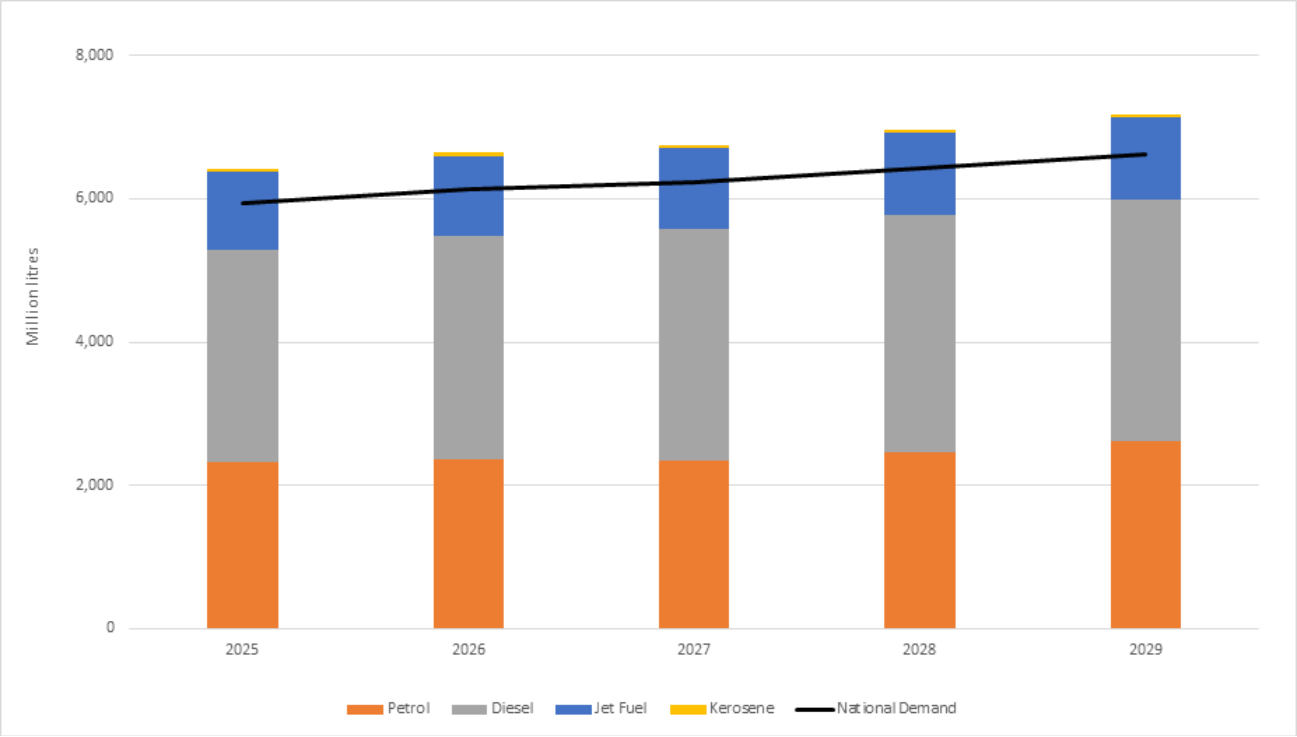

Figure 5.1: Demand-Supply balance for Regulated products (baseline Scenario)

This analysis allows stakeholders to assess potential imbalances between demand and supply, which can inform strategic decisions related to importation, investment, pricing, and policy formulation within the petroleum sector.

5.2.2 Fuel Oil Demand – Supply Balance

As at March 2025, Kenya's Fuel oil installed storage capacity was estimated at 186.25 million cubic litres

The demand for fuel oil has been on the decline largely due to the winding up of Power Purchase Agreements (PPAs) for a number of thermal power plants. Figure 5.2 below shows the demand-supply balance for Fuel Oil.

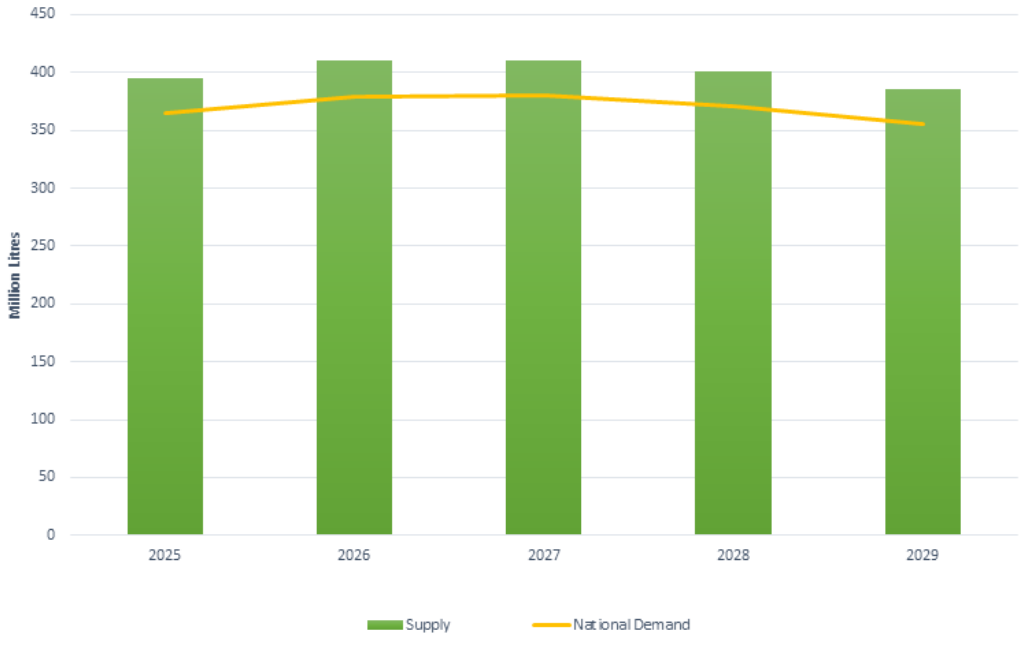

Figure 5.2: Demand- Supply balance for Fuel Oil

5.2.3 LPG Demand – Supply Balance

As at March 2025, Kenya's LPG installed storage capacity was estimated at 44.43 thousand metric-tonnes.

In analysing the projected demand of 446.19 thousand metric-tonnes for 2025 against a supply of 482.86 thousand metric-tonnes of the installed and available storage capacity, it is estimated that there is safe spare rolling ullage of 4 thousand metric-tonnes (spare capacity). In 2029, the demand will have grown to 588.9 thousand metric-tonnes. The planned supply grows at an average rate of 7.26% from 482.86 thousand metric-tonnes to 637.40 thousand metric-tonnes between 2025 and 2029 as shown in Figure 5.3. This therefore means that the total storage capacity required shall be about 53.12 thousand metric-tonnes. This is an additional 8.69 thousand metric tonnes of storage capacity needed to be installed by 2029.

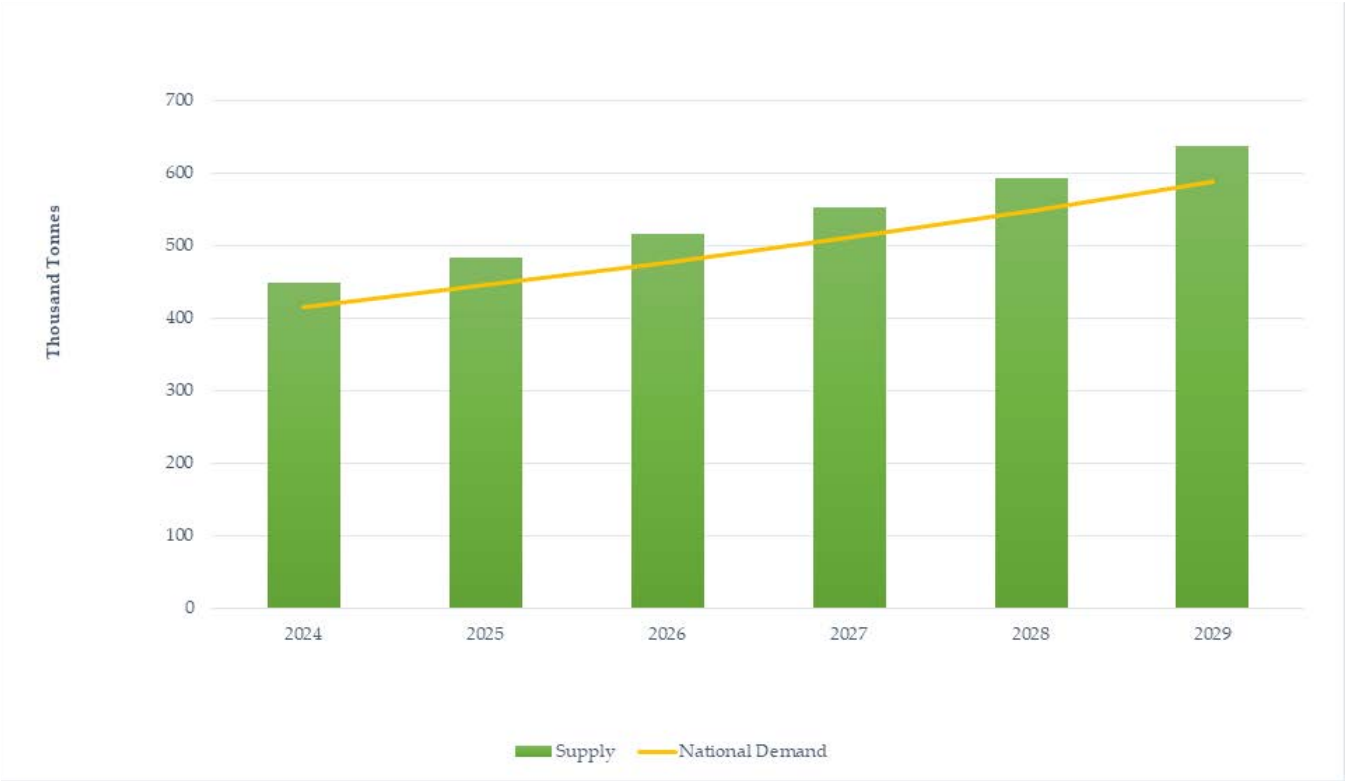

Figure 5.3: Demand- Supply balance for LPG for baseline scenario

The growth in the total demand and supply for petroleum products is primarily driven by sustained population growth, coupled with ongoing economic development initiatives. As the population increases, alongside rising urbanization and industrialization trends, there's a corresponding escalation in demand for petroleum products to fuel transportation and industrial activities.

Additionally, ongoing infrastructure projects and expansions necessitate significant consumption of petroleum-based fuels for construction, maintenance, and operation purposes. Consequently, these demographic and economic dynamics contribute to the projected increase in petroleum product demand over the forecast period.

5.3 Infrastructure Requirements

Based on the demand-supply analysis, below is a summary of specific infrastructure needs in storage, pipelines, jetties and loading facilities in the projection period.

5.3.1 Storage facilities

Assessment of the security of supply is very important to ensure an adequate supply of petroleum products in the event of disruption within the supply chain. The strategic petroleum stocks ensure that the country can sustain fuel supply during prolonged disruptions while operational petroleum stocks ensure the continuous supply of petroleum products under normal market conditions.

In Kenya only the minimum operation stocks are maintained as guided by the Energy (Minimum Stock Operation) Regulations, 2008. However, the draft Petroleum (Strategic Stocks) Regulation is expected to provide a framework through which strategic petroleum stocks can be held. In determining the capacity of the storage facilities required, this plan took into consideration the minimum operational and strategic stocks plus the transit volumes. A share of the local and transit throughput estimates has

been used to estimate the total storage capacity inclusive of the export market.

Table 5.8 shows the storage requirements for the period 2025-2029 to meet domestic demand. The storage capacity is determined as the sum of minimum operational and strategic stocks.

Table 5.8: Storage requirements 2025 - 2029

Product	unit	2025	2026	2027	2028	2029
Petrol	Million ltrs	177.28	179.70	178.28	187.34	199.47
Diesel	Million ltrs	224.54	237.31	245.90	251.44	254.69
LPG	'000 Tonnes	36.67	39.23	42.02	45.07	48.41
Kerosene	Million ltrs	3.70	3.53	3.37	3.22	3.07
Jet fuel	Million ltrs	82.15	83.90	85.34	86.59	87.73
Fuel oil	Million ltrs	29.99	31.17	31.21	30.49	29.25

The Port of Mombasa is a critical hub for petroleum imports, not only for Kenya but also for the broader East and Central African region. It serves as the main entry point for fuel destined for landlocked countries such as Uganda, Rwanda, Burundi, South Sudan and parts of the Democratic Republic of Congo (DRC). In assessing the infrastructure needs within the supply chain, this plan considered both products destined for the local and export market. The share of demand for local and transit was estimated using KPC's throughput numbers for 2024 as shown in Table 5.9.

Table 5.9: Share of local demand on imports

Product type	Estimated ratios (local: transit)
Petrol	52:48
Diesel	59:41
LPG	90:10
Kerosene	50:50
Jet fuel	78:22
Fuel oil	80:20

The overall storage requirements inclusive of transit goods is presented in Table 5.10. For all products except LPG, the existing storage capacity as indicated in the base year (2024) can adequately accommodate local and transit demand over the medium term.

Table 5.10: Storage requirements inclusive transit of products

Product	Unit	2024	2025	2026	2027	2028	2029
Petrol	Million ltrs	462.60	339.63	344.25	341.54	358.88	382.12
Diesel	Million ltrs	755.04	380.57	402.23	416.78	426.17	431.68
LPG	000' Tonnes	44.43	40.75	43.59	46.69	50.08	53.79
Kerosene	Million ltrs	52.77	7.40	7.06	6.74	6.43	6.14
Jet fuel	Million ltrs	231.84	105.32	107.56	109.41	111.02	112.47
Fuel oil	Million ltrs	186.25	37.49	38.96	39.01	38.11	36.56

Based on the current installed infrastructure there is need to invest in additional LPG infrastructure by 2027 to be able to keep up with the increasing demand.

5.3.2 Product evacuation facilities (Pipelines, Jetties and Loading facilities)

A key challenge in the petroleum supply chain is the imbalance in infrastructure investments, where expansions in one segment are not matched by corresponding upgrades in others. For example, while the expansion of offloading facilities has increased import capacity, the absence of parallel enhancements in pipeline and storage infrastructure has resulted in congestion, operational inefficiencies, and costly delays in product evacuation. These bottlenecks contribute to persistent demurrage costs, impacting overall supply chain efficiency. A well-coordinated, strategic investment approach is critical to ensuring seamless fuel handling, storage, and distribution, ultimately enhancing reliability and cost-effectiveness. Based on the demand forecast and the assessment of storage facilities, Table 5.11 provide an analysis of the evacuation facilities required to meet the forecasted local and transit demand for petroleum products.

Table 5.11: Overall throughput requirements

Infrastructure	Unit	2025	2026	2027	2028	2029
Pipeline/ Jetty/ Loading facilities	m3/hr	1,104.76	1,156.82	1,195.96	1,214.53	1,253.47

The current evacuation capacity at KOT 2 as shown in Table 51 stands at 4,000m3 /hr for PMS, 4,500m3/hr for AGO and Jet A1. From the analysis on jetty infrastructure in Table 511, it appears the current installed infrastructure is sufficient to cater for the growth in demand over the planned period.

In estimating the pipeline requirements, consideration must be made on the existing node points (loading facilities) where petroleum products are loaded into road tankers. This in essence reduces the required flow rates as petroleum products are pumped upcountry. The current installed pipeline infrastructure is as shown in Table 5.12:

Table 5.12: Installed Pipeline Infrastructure

Pipeline	Flow rate (m3/hr)
Mombasa - Nairobi (Line 5)	1,200
Nairobi - Eldoret (Line 2)	220
Nairobi - Eldoret (Line 4)	510
Sinendet - Kisumu (Line 3)	110
Sinendet - Kisumu (Line 6)	290

The complementary node infrastructure at Nairobi and Nakuru is as shown in Table 513:

Table 5.13: Node infrastructure for Nairobi & Nakuru

Terminal	Product	Flow rates (m3/hr)	Notes
Nairobi	PMS	450	*Pump-over estimates at OMC depots as there are currently no loading facilities at PS 10
	AGO	450	
	IK	150	
Nakuru	PMS	540	
	AGO	360	
	IK	180	

Notably the current Mombasa Nairobi line (Line 5) would require to be upgraded to meet the demand past 2028.

5.4 Implementation plan

Table 5.14 shows the proposed receipts, storage facilities, Pipelines and Loading facilities

Table 5.14: Proposed Infrastructure Plan

Facility	No.	Activity	Impact	Status	Year	Responsible Agency
Western Line	1.	Upgrade Line-4 to 750m3/hr	To cater for increase in Market demand	Ongoing	2025	KPC/KPRL
	2	Additional pipeline from Sinendet to Kisumu	To cater for increase in Market demand	Proposed	2029	
	3	Replacement of Line-2 pumps whenever their efficiency deteriorates	To sustain flowrate	Proposed	Subject to efficiency levels	
	4	Upgrade depot inlet pipes at PS27&28 during Line-4 phase 3 capacity enhancements	To sustain Flow efficiency/ safety.	Proposed	2026	

Facility	No.	Activity	Impact	Status	Year	Responsible Agency
	5	Resize PCV on line-6 at Sinendet to accommodate higher flow rates during upgrade of Line-4.	To cater for Increased demand market through Kisumu depot	Proposed	2026	
KOSF & KPRL Depots	1	Integrate KPRL & KPC process control systems	Operational Efficiency	Ongoing	2026	
	2	Rehabilitate the inactive KPRL tanks in Changamwe and upgrade the connectivity to new KOT	Optimization of new KOT through use of the additional storage	ongoing	2026	
	5	Increase evacuation and pipeline flow rate through Line 5 upgrade to flowrate at 1,750m3/hr	To cater of increased hinterland products demand.	Proposed	2026	
JKIA Tanks	1	Construction of a new receiving tank	To increase day stocks, cover	Proposed	2027	
	2	Upgrade of tank inlets when Eastern line flow rates are increased	To cater for increased demand	Proposed	Subject to Eastern capacity enhancement	
Nairobi Terminal	1	Construction of a bypass for products to flow directly to WKPE and synchronization of controls for the Eastern Line and WKPE	Increase efficiency and ullage creation.	Proposed	2027	
	2	Replacement of pipeline inlet and installation of diffusers on all floating roof tanks when Eastern Line flow rates are increased	To increase efficiency	Proposed	Subject to Eastern capacity enhancement	
Nakuru station	1.	Conversion of 1No. PMS to a swing tank	To cater for PMS demand	Proposed	2025	
Eldoret station	1	Additional PMS tank which should also be a swing tank for AGO	To improve efficiency/ ullage	Proposed	2026	
Kisumu Station	1.	Additional PMS tank by which should also be a swing tank for AGO	To improve efficiency/ ullage	2027	2026	
	2	Enhance Jet A-1 inter tank transfer flow rates	To improve efficiency/ ullage	Proposed	2026	
	3	Additional Jet A-1 receiving tank	Provide additional ullage for increased market demand	2029	2026	
Loading Facilities						
Kisumu, Nakuru & Eldoret	1	Conversion of Top Loading to Bottom Loading Facilities	To improve product evacuation rate	Proposed	2026	KPC/KPRL
LPG Facility						

Facility	No.	Activity	Impact	Status	Year	Responsible Agency
Lake Gas Jetty (Imports handling)	1	Lake Gas The terminal serves Lake Gas The jetty comprises of 1No. berth with dedicated lines for LPG -12 inch @ 250MT/hr	At 95% operational time, the Jetty facility can handle an annual volume of LPG – 2.0 millions MT	Ongoing	Nears commissioning	Lake Gas
Taifa Gas		Development of import Handling Facility	To provide for increased demand	Ongoing	2028	
LPG Additional Facility at KPRL		Development of import Handling Facility	To provide for increased demand	Proposed	2029	KPC/KPRL

5.5 Monitoring and Evaluation

Petroleum infrastructure is a critical backbone of Kenya's energy security, and regional trade competitiveness. As the country continues to expand its oil and gas value chain—spanning import terminals, pipelines, storage facilities, and prospective export corridors—there is a growing imperative to ensure that infrastructure development is not only efficient and sustainable, but also resilient. One of the foremost challenges Kenya faces is the risk of petroleum supply shocks, which can arise from logistical bottlenecks, infrastructure failures, underinvestment or misaligned planning and execution. Such disruptions have far-reaching consequences, including increased fuel prices, transport paralysis, inflationary pressure, and public discontent.

To mitigate these risks, effective monitoring of petroleum infrastructure development is essential. The primary objective is to ensure that infrastructure constraints do not become a source of national supply vulnerability. Through real-time tracking and performance assessments, sector shall detect inefficiencies, prevent failures, and guide evidence-based decisions that enhance reliability and system capacity. To be effective, annual monitoring will be conducted to assess system-wide performance, capacity adequacy, and alignment with national energy security goals. As part of monitoring and evaluation, it is recommended that an infrastructure-based key performance indicator (KPIs) be tied to tariff reviews.

6. EMERGING ISSUES IN PETROLEUM SUB-SECTOR

6.1 Introduction

Globally, countries strive to meet growing energy demand, reduce carbon emissions, and ensure affordable access. The petroleum industry faces a host of challenges and opportunities mainly determined by geopolitical factors, macroeconomic variables such as high interest rates and rising cost of materials, evolving policies and regulations, and the emergence of new technologies. These challenges are largely driven by the energy trilemma. The global energy sector is increasingly grappling with the energy trilemma—the delicate balance between energy security, energy equity (affordability and access), and environmental sustainability.

In Kenya, this trilemma is particularly pronounced. The country's oil discoveries in Turkana County, ongoing exploration activities, and reliance on petroleum products for transportation, industry, and power generation have placed the petroleum sub-sector at the heart of Kenya's energy future. Petroleum remains a critical component of Kenya's energy mix, contributing to economic growth, employment, and infrastructure development. However, challenges such as global oil price volatility, environmental concerns, infrastructure gaps, and shifting global trends toward renewable energy have exposed the sector to emerging risks and opportunities.

As Kenya continues to industrialize to meet its growing energy needs, the petroleum sub-sector must navigate complex emerging issues while balancing the three competing priorities of the energy trilemma. This calls for strategic reforms, investment in cleaner technologies, and policy shifts to ensure a resilient, affordable, and sustainable petroleum industry.

This section provides a critical look into the factors that provide challenges and opportunities for the Kenyan petroleum sector and subsequently, consumer demand for petroleum products.

6.2 Energy Transition

The government is strategically developing and implementing polices that enhance clean energy in the country. This includes promotion of clean cooking gas, e-cooking and e-mobility that has a potential of damping growth in consumer demand for petroleum products.

6.2.1 Clean Cooking Gas

The Government has been undertaking various campaigns to enhance Clean Cooking Gas (CCG) penetration in learning institutions in the country. To further enhance the uptake of CCG, the Ministry has developed the LPG growth strategy that provides a framework to increase LPG use in learning institutions across the country. It is envisioned that full implementation of the strategy shall increase LPG demand in the country. The use of LPG is projected to increase from 37% in 2028 to 56% in 2050.

6.2.2 E-Cooking

The e cooking strategy has modelled different scenarios that will see the increase of uptake of e cooking in the country. In the business-as-usual scenario, it is projected that kerosene will be phased out by 2030. A net zero scenario which envisions a comprehensive shift toward sustainable and clean cooking practices, contributing to the overall goal of achieving net-zero emissions in the cooking sector was also modelled. The net zero scenario also known as the best-case scenario projects that kerosene will be phased out completely by 2030 from a 27% usage in 2019. LPG in this scenario is projected to play as a transition fuel for cooking in the urban areas. It is projected to dominate in the early stages but decrease gradually through substitution by ethanol and electricity to completely phase out by 2050. The e-cooking strategy once adopted will also affect consumption patterns of the petroleum products.

6.2.3 E-mobility

In Kenya, the transport sector is almost entirely dependent on fossil fuel given that the sector utilizes about 72% of petroleum products that are imported into the country. In 2015, the transport sector accounted for 13% of Greenhouse gases emissions with projections indicating that the same would increase to 17% by 2030 due to population growth and industrialization among other factors. Between 2009 and 2019, domestic transport emissions increased by 59.4% with the road transport being the most significant contributor.

The National Climate Change Action Plan (NCCAP) 2023-2027 documents action plans to achieve the target of the submitted NDCs in the country. It identifies uptake of electric vehicles as one of the climate actions in the transport and energy sectors.

The National Energy Efficiency and Conservation Strategy (2020) also envisions that by 2025, 5 per cent of all registered vehicles in Kenya will be electric powered. Similarly, the Long-Term Strategy 'Towards a net zero scenario by 2050' targets transition to e-mobility.

Reports by the NTSA, indicate that , , petrol powered vehicles between 2017 and 2023 accounted for 90.34% of all vehicles in Kenya. Diesel powered vehicles followed at 9.52% and electric vehicles (EVs) at 0.086% where EVs exclude hybrid vehicles. It was also noted there was a significant growth of registered EVs in Kenya from 0.04% in 2020 to 0.08% in 2023.

In a bid to actualize the uptake of e-mobility in Kenya, the Government through the Ministry of Roads and Transport has developed a National Electric Mobility Policy. The overall objective of Policy was to create an enabling environment for the growth and adoption of electric vehicles in Kenya.

This policy shift is expected to affect the growth in demand of petroleum products

6.3 Climate Change and Climate Change Protocols

The Paris Agreement adopted at the UN Climate Change Conference (COP21) in Paris, has an overarching goal of to hold: "the increase in the global average temperature to well below 2°C above pre-industrial levels" and pursue efforts "to limit the temperature increase to 1.5°C above pre-industrial levels.". One new specific target conceded to at a global scale was to triple renewable energy capacity and double energy efficiency by 2030.

Kenya recently released her second Nationally Determined Contribution (NDC) under the Paris Agreement. The country has defined a new target to reduce Green House Gas emissions by 35% by 2035.

The Climate Change Act provides a regulatory framework for the enhancement of climate action and mechanisms to ensure the achievement of low-carbon climate development in the country. Measures such as phasing out fossil fuel subsidies will be taken to drive the transition away from fossil fuels. This will in turn affect future consumption patterns of petroleum products as well as their attendant infrastructure investment.

6.4 Shift in Consumption Patterns

6.4.1 LPG fuelled vehicles.

Due to the soaring prices in petrol, a number of motorists in Kenya have been opting for the liquefied petroleum gas (LPG) in efforts to save on fuel costs. According to NTSA reports, vehicles powered by other technologies accounted for 0.0315% between 2017 to 2023. These are mainly LPG powered vehicles mainly taxis in the capital city Nairobi. LNG for Power Generation

The Government intends to phase out all the diesel-powered thermal power plants in the country at the final lapse of their PPAs. This provides an incentive for the owners of these power plants to switch their engines to Liquefied Natural Gas (LNG). These category of power plants also provide an added advantage of peaking capacity to the electricity network due to their flexibility.

6.4.2 Green Hydrogen

Green hydrogen has been identified as having the potential role of decarbonising the road transport sector while its derivatives can potentially decarbonise shipping,via ammonia or methanol, and aviation,via Sustainable Aviation Fuels(SAF)The Green Hydrogen Strategy and Roadmap for Kenya targets to have pilot projects in the transport sector by 2030 that will stimulate domestic growth market for green hydrogen in the country.

6.4.3 Energy Efficiency

The National Energy Efficiency and Conservation Strategy (NEECS 2020) aims at improving energy efficiency and conservation, which will lead to improved energy security, reduction in the expenditure of foreign currency reserves on energy imports, and lowered cost externalities associated with emissions.

According to the strategy, the transport sector consumes 72% of all petroleum products imported into the country. Out of this, road transport accounted for 84% of the petroleum fuel demands. At the time the report was released, Kenya had about 2 million vehicles of which 98% were using petrol and diesel proportional to Carbon (IV) Oxide emissions.

This strategy has set out four targets in the transport sector: improvement of the fuel economy performance and reduction of CO2 emissions; increasing the share of electric vehicles in the transport sector, aiming to reach five per cent of the annual import of vehicles to be electric by 2025; enhancing public modes of transport by increasing the number of passengers using commuter trains from 116,000 to 150,000 per day; and improving urban vehicular movement management by enhancing the speed of vehicles through reduced traffic jams and increased parking capacity.

The targets set in NEECS have outlined actions to either reduce fuel consumption in motor vehicles or replace it entirely, reducing fuel consumption in the transport sector.

7. RISK IMPLEMENTATION OF THE PETROLEUM DEVELOPMENT PLAN

This chapter identifies the risks associated with the petroleum supply chain in Kenya, in the implementation of the petroleum development plan medium term plan 2025-2029. The report identifies infrastructure capacity and modernization as a critical factor. The report also underscores security concerns, particularly around the overdependence on KPC pipeline and oil transportation corridors. Climate risks and environmental compliance are mentioned in the context of sustainability and safety standards. Concerns around policy stability and regulatory clarity have also been highlighted in the report..

The risks have been categorized as follows : project management (infrastructure); policy and regulatory; and demand-supply risks. The categorisation offers a clear line of sight into systemic, regulatory, and market-driven risks, allowing for targeted mitigation planning. Table 7.1 provides the risk analysis for the petroleum supply chain in the implementation of the PDP 2025-2029.

Table 7.1: Risks in implementation of the PDP 2025-2029

No	Risk Description	Cause	Mitigation Measures
Project Management (Infrastructure Risks)			
1	Legacy infrastructure. Delays in projects (e.g. Lokichar-Lamu)	Increased maintenance cost and non-availability incidences due to breakdowns. Over-reliance KPC's pipeline system. Funding gaps	Fast-track projects. Invest in alternative modes (rail/road); PPPs
2	Port congestion at Kipevu Oil Terminal. Port inefficiencies	Limited berth capacity. Manual processes, high traffic volume	Expand terminal capacity. digitize clearance. streamline customs clearance
3	Exposure to international supply shocks	Absence of refining capacity Limited storage capacity. Outdated depots. Limited strategic reserves	Rehabilitate/build refineries. Develop new storage sites. Encourage PPPs.
4	Security risks (vandalism, terrorism, theft)	Poor surveillance, Community grievances Political instability	Enhance surveillance. Secure community buy-in Train and sensitize response team
5	Data/system unreliability (ERP failures, manipulation)	Cyber threats. Weak controls	conduct regular audits enhance redundancy systems with more remotely operated systems

No	Risk Description	Cause	Mitigation Measures
Policy and Regulatory Risks			
6	Procurement Regulatory framework	Gives exclusive trading rights to select OMCs. Inconsistent contract enforcement	Review and enforce procurement contract obligations. Enhance competitive bidding by OMCs. Stakeholder dialogue
7	Public opposition and land-related delays (Wayleave acquisition challenges-future projects)	Poor stakeholder engagement. No Clear compensation frameworks	Transparent land acquisition. Early engagement; CSR initiatives
8	Regional geopolitical instability (affecting cross-border trade)	Fragile neighbors (e.g. South Sudan), Limited diplomatic leverage	Strengthen EAC energy frameworks. Diversify trade routes
9	Pressure from global energy transition policies such as electric vehicles, hybrid, and hydrogen fuelled vehicles which have lesser carbon emission.	International and national decarbonization targets. Investor preferences	Plan phased transition. Invest in LPG, LNG, biofuels and other transition fuels
Demand – Supply Risks			
10	Demand growth outpacing infrastructure development in urban and remote areas	Population growth, urban sprawl. Logistical delays	Expanding depot network. Incentivize private investment
11	Currency volatility and pricing shocks (imported inflation)	Global oil prices, weak shilling, forex exposure	Use stabilization fund

8 CONCLUSION AND RECOMMENDATIONS

8.1 Conclusion

This report has forecasted and presented results of consumption patterns for six petroleum products, for the medium-term period from 2025 to 2029. Three scenarios were developed to allow for comparative analysis of the forecasted results– baseline, optimistic and pessimistic. The demand for four of the petroleum products is forecasted to grow except for demand for kerosene and fuel oil. The demand for fuel oil is projected to grow until 2028 after which it is expected to decrease for the remaining period of the plan due to the winding up of PPAs for a number of thermal power plants.

The variables used in forecasting demand have been used to explain the demand patterns for the associated petroleum products. Majorly, economic development and rising GDP per capita in the country that can lead to greater industrial activity and demand for energy are reasons why demand for petroleum products is expected to grow over this plan period.

Despite efforts to promote renewable energy sources, the lack of widespread alternatives and infrastructure may mean that petroleum remains the primary source of energy in Kenya for the foreseeable future

In planning for supply of the various petroleum products to meet projected demand a 30-day total stock cover is established, comprising 15 days of minimum operational stock and 15 days of strategic reserves. The total supply is then projected to grow to 8,297.69 million litres in 2029 against a total demand of 6,630 million litres in 2029 with the surplus covering both operational and strategic stocks. The infrastructure needed to meet this requirement is both given in terms of product evacuation (pipeline, jetty, loading facility) and storage facilities. KOT-2 Jetty evacuation capacity is seen to be more than sufficient to cater for the throughput requirements to meet projected demand over the planned period.

In terms of pipeline infrastructure, the Mombasa-Nairobi (line 5) will require an upgrade in throughput capacity post 2028 with the throughput projected to increase beyond 1,200 m3/hr. The complementary node infrastructure at Nairobi and Nakuru have a total flow rate of 2,130 m3/hr at optimal operation. This alleviates the need for additional pipeline infrastructure to supply Western Kenya depots. The loading facilities however do not operate continuously

The capacity for storage facilities takes into consideration the share for the transit market. Kenya serves as the main entry point for transit fuels for landlocked countries such as Uganda, Rwanda, Burundi, South Sudan and parts of the Democratic Republic of Congo (DRC). Taking into account products for the export market the storage capacity requirements for Fuel Oil, Jet Fuel, Kerosene, Petrol and Diesel are seen to be sufficient. There is need to have additional storage infrastructure for LPG from 2027, projected to require more than 45,000 tonnes of storage capacity in 2027.

An analysis done showed that the total projections based on the 2025 model were found to be lower than those based on the 2024 model. The variation can be explained by the fact that the re-estimated equations for 2024 involved inclusion of more relevant variables, making use of more data points based on recent data. In addition, the 2025 projection made use of revised assumptions that reflect recent trends in the explanatory variables.

8.2 Recommendations

Kenya continues to implement policies and plans to realise its long-term objective of an industrialised middle-income country. This has seen an increase in demand for transportation services and other industrial activities, consequently, driving up demand for petroleum products. Additionally, the demand for petroleum products has seen positive growth due to inadequate access to alternative energy technologies such as transition fuels, electric vehicles and associated infrastructure required to promote their uptake.

The following recommendations have been proposed targeting infrastructural developments to meet the growing demand for petroleum products:

a. To ensure a steady and uninterrupted supply of petroleum products, it is imperative to enhance both storage and evacuation capacity to match rate of discharge at the new KOT- 2 jetty as illustrated in Table 514.

b. Initiate procurement and development of line 7 to increase pipeline capacity and improve product flow efficiency between Mombasa and Nairobi by 2028.

c. Upgrade capacity of line 4 to meet increasing demand in Western Kenya and transit demand.

d. Initiate procurement of an additional pipeline from Sinendet to Kisumu by 2029 to serve increased regional demand.

e. Due to the expected growth of demand in LPG the country shall need an additional 6.5 thousand metric tonnes of storage capacity needed to be installed by 2028 to cater for both national and transit markets.

f. The country continues to realize increased investment of primary storage for LPG at the coastal region. However, the current mode of transportation of this product to the hinterland and export market is by road tankers. This is an inefficient mode for such a large quantity of LPG.

g. To improve on the evacuation rate of LPG, it is proposed that a 10 thousand metric-ton secondary storage be constructed in Nairobi which is served by a railway siding. 1 to 5 thousand metric-ton secondary storage can be considered for Kisumu and Eldoret to serve surrounding regions.

h. To meet the demands for the LPG markets, it is essential to utilize multi-modal transport systems including railway and roads. This will ensure adequate supply of LPG both in the mainland and hinterland with Government efforts to increase demand for the product.

i. Reticulation of LPG in gated communities and apartments as well as learning institutions is gaining popularity. It is proposed that the Authority develops tariff setting methodologies to ensure cohesive relationship between the infrastructure owner/operator/suppliers and the users.

j. Scale up LPG for cooking by promoting reticulation of LPG in gated communities and apartments as well as learning institutions.

k. There is need to continue implementing the recommendations of the National LPG strategy which among others recommends intensification of LPG use in the country.

l. The Authority to undertake a sub-national petroleum demand study to guide new infrastructure development.


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