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Director General's Word



Happy New Year!

Happy New Year!

I am delighted to introduce the inaugural edition of the Energy and Petroleum Regulatory Authority's (EPRA) biannual magazine, a publication that serves as a key platform to inform, educate, and engage our stakeholders on the ever-evolving dynamics of the energy sector.

We have put together articles that

the trends and developments within the energy sector, such as discussions around innovation in energy storage and battery technology and the ongoing transformation in electric mobility. These topics represent the exciting strides being made worldwide, positioning the energy sector as a cornerstone for sustainable development.

Within EPRA, the period has been marked by several milestones, most notably the designation of the Authority as the official local issuer of the International Renewable Energy Certificates (I-RECs) in Kenya. This achievement not only reinforces our commitment to sustainability but also allows Kenya to play a vital role in the global push for renewable energy adoption. By providing credible certification for renewable energy generation, I-RECs enable organisations to achieve their sustainability goals while driving investment in clean energy infrastructure. For Kenya, this is a crucial step toward reducing our carbon footprint and enhancing the country's energy security.

Looking at the year ahead, the global energy sector is poised to witness significant developments. Analysts project continued advancements in

renewable energy technologies, the rise of green hydrogen as an alternative fuel, and further innovations in energy storage solutions to overcome the challenges of intermittency in solar and wind power. Additionally, the integration of artificial intelligence in energy management systems is expected to drive efficiency and sustainability across supply chains. These trends underscore the importance of fostering local and regional innovations to maintain competitiveness and align with global shifts.

Thank you for your continued partnership as we build a resilient, innovative, and sustainable energy sector for Kenya.

Daniel Kiptoo Bargeria, MBS, OGW

Director General

Global Renewable Agency Appoints Energy Regulator To Issue I-REC(E) Certification In Kenya

By Immaculate Mwende

The International Tracking Standard Foundation (I-TRACK Foundation) Board has appointed Energy and Petroleum Regulatory Authority (EPRA) as the official local issuer of the International Renewable Energy Certificates I-REC(E). This bestows on the Authority a new role of inspecting energy generation facilities across Kenya to verify if the electricity generated is from renewable sources, for purposes of issuance of renewable energy credit certificates. The process, which was initiated in January 2024, was finalized in December 2024, making EPRA the approved I-REC (E) issuer in Kenya.

Speaking on the approval, EPRA Director-General Daniel Kiptoo said the milestone aligns with EPRA's mandate of

leading the charge of Kenya's journey to full realisation of renewable and sustainable energy by 2030. A company with an I-REC(E) certificate receives favourable investor attention as their operations are deemed eco-friendly, in line with ESG goals.

"Kenya is on the cusp of achieving 100 percent renewable energy electricity generation which currently stands at 80.04% percent contribution to the energy mix. We have remained steadfast in harnessing energy from renewable energy sources. Geothermal energy stands at 26.37 percent, interconnected solar PV systems (12.38 percent) and wind energy contributed 12.19 percent. The trajectory towards renewable energy is expected to persist as more power projects are completed and connected to the grid from geothermal sources," he said.

EPRA's appointment follows a rigorous review of its expert capabilities by the I-REC team, which will see it, take over the new role from the Green Certificate Company (GCC).

The I-REC(E) certification scheme is in conformity with Kenya's commitment under the Paris Agreement and the Sustainable Development Goals (SDGs), particularly SDG 7 and SDG 13.

Green investors require that renewable energy project companies seek an I-REC certificate to affirm their clean energy status. This opens a leeway for companies to access affordable funding for faster implementation of projects.

EPRA Drafts Energy Auditing Guidebooks To Improve Energy Efficiency In The Country

By Immaculate Mwende

The Energy and Petroleum Regulatory Authority (EPRA) has embarked on a book project to write guidebooks for energy auditing. The guidebooks are prospected to build capacity for individuals practicing in the energy efficiency space and those aspiring to join the same. The books will consist of several volumes covering various energy-consuming systems like compressed air,

steam, pumping, industrial material transport and industrial power transmission.

Dr. Eng. Fenwicks Musonye, the Deputy Director for Energy Efficiency at EPRA, told the energy scoop that the guidebooks aim to improve the quality of energy audits conducted by energy auditors and improve energy efficiency in industrial, commercial and institutional facilities.

"These guidebooks provide theoretical and practical guidelines to auditors on how to approach different energy efficiency problems they encounter while conducting energy audits in energy consuming facilities," said Musonye.

The books are part of the tools auditors will require to conduct comprehensive energy audits. Energy auditing plays a central role in the energy management system.

EPRA Shuts Down Twenty Eight Petroleum Retail Stations Selling Adulterated Fuel

By Bon Osia

The Energy and Petroleum Regulatory Authority (EPRA) shut twenty-eight petroleum retail stations found to be trading in adulterated and export bound fuels in the local market, during the first half of 2024/2025 Financial Year.

During the July – December 2024 period, 11,824 tests were conducted in 2,616 petroleum-dispensing sites.

EPRA is mandated under Section 92 of the Petroleum Act 2019 to monitor petroleum products offered for sale in the local market with the aim of preventing motor fuel adulteration and dumping of export bound fuels.

EPRA Staff Extend Holiday Cheer To Care Home In Nairobi



By Immaculate Mwendu

On 22nd December 2024, EPRA staff donated dry foodstuffs, cooking oil, and sanitary items to House of Charity Children's Home on Waiyaki Way. The initiative was meant to spread Christmas cheer to over 20 toddlers who are residents in the home.

The mission was led by Ms. Letitia Ouko, the Deputy Director, Corporate Communications. While presenting the items, Ms. Ouko reiterated the need for sustainability of such initiatives.

"We are proud to support these children as part of our initiatives to give back to the community. The well-being of children should be the concern of every responsible citizen in the country. We intend to continue supporting this initiative every year," said Ms. Ouko.

The activity is part of EPRA's Corporate Social Responsibility (CSR). These CSR programs are anchored on pillars that amplify social, economic and environmental stewardship.



Accelerating E-Mobility Uptake in Rural Areas: The Pivotal Role of Regulatory Support

By Silas Sanga, Lee Okombe, and Arnold Musalia

As Kenya moves decisively toward a sustainable future, electric mobility (e-mobility) has emerged as a powerful solution for addressing both environmental goals and economic growth. While urban areas like Nairobi, Mombasa and Kisumu lead the way in e-mobility adoption, rural Kenya—where transportation costs are higher, access to fuel is limited, and infrastructure underdeveloped—face unique challenges that prevent many from engaging with this transformation.

With over 75% of Kenya's population in rural areas, bridging this rural-urban gap in e-mobility adoption is essential. Achieving this goal will require supportive regulatory frameworks, partnerships with local organizations, infrastructure development, and dedicated efforts to engage and empower e-mobility stakeholders in building and sustaining this sector.

The recent Lake Region Motor Show 2024, hosted by Event Africa Limited in Kisumu, demonstrated the importance of regional events in promoting sustainable mobility solutions and the impact that community-centred initiatives can have in expanding e-mobility beyond major cities. Bringing together policymakers, industry experts, and community advocates, this event created a platform to explore how e-mobility could transform rural areas.

As a forward-thinking county, Kisumu County has made notable strides in promoting e-mobility, from establishing charging stations and promoting cleaner vehicles to collaborating with local businesses. Kisumu's efforts provide a powerful model for other counties to follow, showing that county-led leadership and initiatives can accelerate the adoption of e-mobility and pro-

mote a sustainable transport network nationwide.

E-Safiri, a leader in e-mobility solutions for underserved areas, has taken an innovative approach by working closely with Community-Based Organizations (CBOs) to promote sustainable transport across rural Kenya. Through these partnerships, E-Safiri has established practical infrastructure, raised awareness, and created services that support electric vehicle (EV) adoption in remote areas. E-Safiri's community-driven model highlights the role that localized engagement can play in supporting Kenya's ambitious goal of achieving 5% electric vehicle penetration by 2025. This grassroots approach ensures that e-mobility solutions are accessible and feasible for rural users, furthering both local and national sustainability objectives.

At the Energy and Petroleum Regulatory Authority (EPRA), our mission is to create an enabling regulatory environment that supports equitable e-mobility adoption across Kenya. Our first-ever e-mobility tariff, which lowers electricity costs for EV charging—especially during off-peak hours—is a significant step in this direction. This tariff eases the financial burden of EV operation, making e-mobility accessible for rural and urban users alike. The reduced rates encourage businesses to set up EV infrastructure even in areas where services have traditionally been scarce, addressing a key challenge in expanding e-mobility to rural areas.

EPRA has also issued comprehensive guidelines for EV charging infrastructure. These guidelines, which establish safety, reliability, and accessibility standards, enable charging stations across Kenya to meet high standards of service. Designed with flexibility for diverse needs, these guidelines make it easier for stakeholders to establish charging facilities in a range of lo-

cations, from fuel stations and community centres to malls and highways. By ensuring consistency and quality in infrastructure, these guidelines attract private-sector investment and build confidence among rural users, creating a strong foundation for e-mobility across all regions.

The guidelines came at the right time to address concerns such as safety, design and interoperability of batteries and charging infrastructure. The Kenya Bureau of Standards has adapted and adopted EV Charging and Battery Swapping Standards in line with International Best Practices, thereby accelerating the uptake of E-Mobility in Kenya.

Building a sustainable e-mobility sector also requires skilled workers who can install, maintain, and operate EV infrastructure, especially in areas that are traditionally underserved. Recognizing this, EPRA proposes that e-mobility stakeholders consider partnerships with learning institutions especially Technical and Vocational Education and Training (TVET) institutions to equip young Kenyans with market-ready skills in EV mechanics, battery technology, and charging infrastructure installation. By integrating these skills into learning curricula, the nation is empowering youth with the knowledge and expertise needed to support the green transport industry. This capacity-building initiative not only creates employment opportunities but also ensures that skilled personnel are available to serve rural communities, making EV adoption easier and more sustainable in these areas.

Local manufacturing and assembly play an equally crucial role in making e-mobility accessible across Kenya. With over 15 assembly plants now operational, producing vehicles suited to the country's diverse terrains, Kenya's manufacturing sector is growing rapidly. Supporting local production through tax incentives and streamlined import regulations has the potential to reduce costs, making EVs more affordable for rural users. Local assembly further strengthens Kenya's green economy by creating jobs across the supply chain and ensuring that vehicles are readily available, especially in areas where traditional transport networks have struggled to reach.

Public awareness campaigns are essential for encouraging e-mobility adoption. Through Tusonge na EVs Campaign launched in June 2024, a public awareness campaign launched in partnership with the United Nations Environment Programme (UNEP), EPRA is working to demystify electric vehicles and

educate the public on their environmental and economic benefits. Focusing on two- and three-wheelers widely used in rural Kenya, Tusonge na EVs addresses common misconceptions about e-mobility, such as concerns over costs, maintenance and infrastructure availability. By engaging with rural communities directly, this campaign builds trust in e-mobility as a practical and beneficial transportation option for both urban and rural folk.

Kenya's e-mobility journey is not only a national commitment but also a direct contribution to the Sustainable Development Goals (SDGs), particularly SDG 7 (Affordable and Clean Energy) and SDG 11 (Sustainable Cities and Communities). By promoting renewable energy in transport and reducing reliance on fossil fuels, e-mobility drives SDG 7 forward. Furthermore, by reducing emissions, improving air quality, and enabling clean transport, e-mobility aligns with SDG 11, supporting the development of sustainable, resilient communities across Kenya. Leveraging Kenya's renewable energy capacity, which accounts for over 85% of the national grid, e-mobility also decreases greenhouse gas emissions and reduces the need for imported petroleum, enhancing both national sustainability and energy independence.

To meet Kenya's ambitious goal of 5% electric vehicle penetration by 2025, regulatory support must be comprehensive and inclusive, addressing the needs of both urban and rural areas. Initiatives such as the e-mobility tariff, infrastructure guidelines, and youth capacity-building are designed to foster a robust e-mobility ecosystem. Local government leadership, exemplified by Kisumu County's efforts and the successful Lake Region Motor Show, provides a framework that other counties can follow. Partnerships with companies like E-Safiri further strengthen the e-mobility network, expanding its reach and impact.

Kenya's transition to e-mobility holds immense potential to transform the national transport sector. However, realizing this vision requires a regulatory approach that considers and supports the unique needs of rural communities. With strategic regulation, county-driven initiatives, and committed partnerships, Kenya is positioned to lead the region in creating a resilient and equitable e-mobility ecosystem.

The writers work at EPRA

Next Generation Small Wind Turbines

An Inspiration From Nature



Humpback whale manoeuvres



Tubercles in humpback whale and tubercle printed wind turbine



Smooth wind turbine

By Eustace Mureithi Njeru

Business sustainability, clean environment and social development in the marginalised societies has become a priority in the contemporary world. This has led to scientists, engineers and policy makers into searching viable and convenient solutions in energy supply. One of the solutions under focus is the use of electricity in domestic and small enterprises.

The major challenge with electricity supply in the remote areas is the cost of building grid connected distribution lines. The cost of building electricity transmission and distribution to the remote areas is so high compared to its financial benefits. In order to

supply these communities with electricity, distributed generation systems and mini-grids are touted as the most viable solutions. For efficiency and reliability, distributed systems and mini-grids should be as near as possible to the users. Close proximity to the users requires that these systems have relatively small electricity generators with minimum environmental and human impact.

Renewable energy sources like small hydro power plants, solar photovoltaic systems and wind are some of the sources available with low negative environmental and human impact. These benefits notwithstanding, there are challenges related to availability due to dependent seasons and time of day. These seasonality problems require innovation in their design to ensure optimum harnessing of energy from the environment. This means hydro, wind turbines and solar panels, which can harness as much energy as possible from their respective energy sources with minimum negative environmental impact.

Small wind turbine technology is more viable compared to solar photovoltaic and small hydro power plants according to research conducted by Hossam Hamid 2023. The same sentiments are shared by R. Supreeth in research published in March 2023 at International Journal of Renewable Energy Research. The two indicated that wind power is not affected by sunrise or sunset and does not create any air or water pollution. The other major advantage of small wind turbines is that they can easily be installed in building rooftops, small houses, farms, remote communities, water pumping stations and streetlights at relatively

low cost. Despite these advantages, there is need to improve the efficiency of small wind turbines and reduce noise pollution. To achieve these requirements science and engineering researchers have turned into nature for solutions.

Some of the common natural phenomenon, which have caught attention of researchers, are the design and the behaviour of the aquatic beings and plants. These aquatic beings like humpback whale, scales of fish and Archimedean spiral shapes found in several creatures like Japanese Wonder Snail (Miraculous Thatcher), Spiral Aloe (Aloe Polyphylla) and sunflower have extraordinary characteristics. The humpback whales for instance, are excellent swimmers with unmatched hydrodynamic manoeuvrability despite their gigantic physical size. The Archimedean spiral occurs in nature and has a wide range of use in science and engineering. It is preferred in design of mechanical systems, which transmit motion from one form to another, which is like in transmission of circular motion to linear.

Researchers are assessing the possibilities of incorporating tubercles shapes found in humpback whales in small wind turbines. Tubercles are excellent flow control devices in humpback whales and battle fish like Siamese fighting fish. The extreme manoeuvrability of the humpbacks is attributed to the knob like structures on their flippers called the tubercles.

Research conducted by Supreeth (2022) and others, titled the “Whale Inspired Tubercles for Passively Enhancing the Performance of a Wind Turbine Blade,” established that small wind turbines with tubercles printed in them have better performance than smooth blades wind turbine. It was established that turbines with tubercles exhibit torque, power and power coefficient of 14%, 17% and 13% greater than smooth blades respectively.

In future, a combination of tubercles and Archimedean spiral might assist in improving the performance of small-scale wind turbines. As studies have shown, nature has solutions to some energy issue. These range from operation optimisation and environmental issues. Tubercles in humpback whales, fish scales, shape Japanese Wonder Snail shell and arrangements of leaves in spiral aloe plants, present some of the natural phenomenon, which can be accommodated in designs of energy generation infrastructure.

The writer is a Senior Energy Efficiency Officer at EPRA





A Leap Towards Cleaner Energy: The Growth Of LPG Consumption In Kenya

By Gladys Njoroge

Once seen as a luxury for a few, Liquefied Petroleum Gas (LPG) has steadily evolved into a vital component of Kenya's energy mix. Its growing usage reflects a shift toward cleaner, more sustainable alternatives. The financial year 2023/2024 marked a transformative chapter in Kenya's energy journey, particularly in the adoption of LPG. According to the Energy and Petroleum Statistics Report published by the Energy and Petroleum Regulatory Authority (EPRA), per capita LPG consumption rose from 333,830 metric tonnes in 2022 to 360,594 metric tonnes in 2023—an 8% increase, which speaks volumes about the growing embrace of this versatile fuel.

Kenya's access to LPG hinges on a well-established network of entry points that

ensure steady supply to meet demand. The Port of Mombasa remains the backbone of the LPG supply chain, handling 59% of all imports during the financial year. Its dominance is no surprise, given the port's enhanced capacity and infrastructure for handling LPG shipments. Meanwhile, border points such as Namanga and Loitoktok accounted for 27% and 13% of imports respectively, while smaller but essential contributions came from Taita Taveta and Lunga Lungu, which collectively accounted for 1%. These diverse entry points underscore the country's commitment to securing a reliable supply of LPG for its citizens.

Behind the impressive growth of LPG consumption lies the Kenya government's deliberate actions to support the sector. One of the most significant developments in recent years has been the acquisition

of the Kenya Petroleum Refineries Limited (KPRL) facility by the Kenya Pipeline Company (KPC). This move has added an additional 1,195 metric tonnes of LPG receiving capacity, raising the total storage capacity in Mombasa to 27,335 metric tonnes. This enhancement has bolstered the country's ability to handle larger shipments, ensuring consistent supply and addressing storage bottlenecks.

Equally impactful was zero-rating of LPG in the Finance Act 2023. By zero rating LPG, the government made it more affordable for households and businesses. This bold policy decision directly lowered costs for consumers, encouraging more people to transition from traditional fuels such as firewood and charcoal to LPG.

An initiative that has further fueled its

rise in Kenya is the implementation of the LPG Growth Strategy that was launched in 2023 with the aim of increasing LPG per capita consumption, from the current 7 kilograms to 15 kilograms by 2030. This program is designed to promote LPG use in institutions such as schools, prisons, and other facilities, replacing less efficient and environmentally harmful fuel sources. By targeting these large-scale users, the strategy not only increases LPG consumption but also underscores the government's commitment to cleaner energy solutions.

The strategy aligns with Kenya's development agenda, including its commitment to achieving the United Nations Sustainable Development Goals (SDGs). In particular, it supports Goal 7, which emphasizes universal access to affordable, reliable, and modern energy.

Beyond cooking and heating, LPG is carving out a new niche in Kenya's energy landscape: autogas. This alternative fuel for vehicles is gaining popularity as a cleaner, more cost-effective option for powering engines. As of 2023, approximately 15,000 vehicles in Kenya had been converted to run on

LPG, reflecting growing awareness of its benefits.

To support this trend, 17 autogas dispensing stations have been established across the country. These stations cater to the rising number of LPG-powered vehicles, signaling a quiet but steady revolution in Kenya's transportation sector.

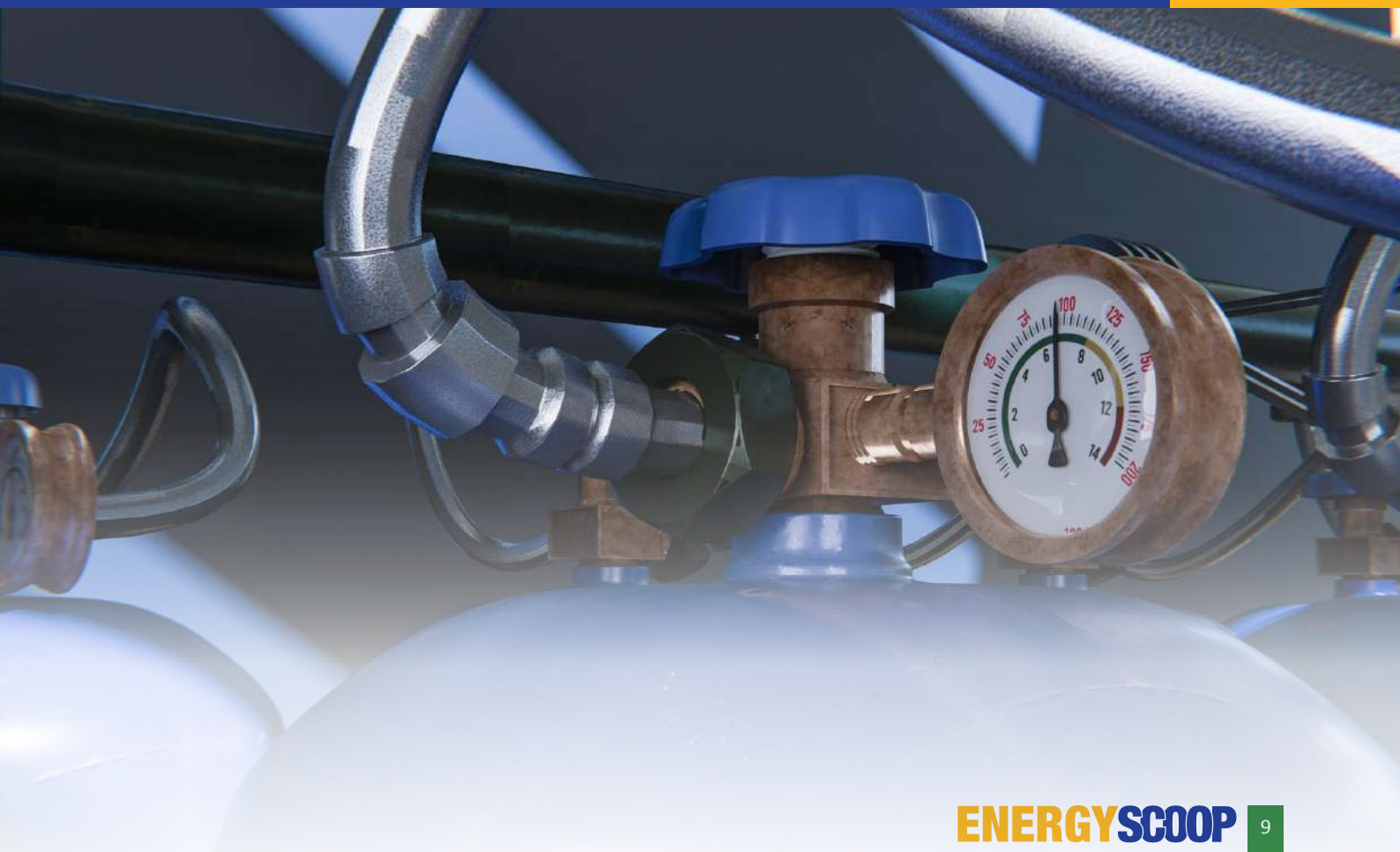
The growth in LPG consumption is yielding benefits for Kenya. From an environmental perspective, LPG adoption reduces deforestation and minimizes indoor air pollution, especially in households transitioning from traditional fuels. This shift significantly improves public health, particularly for women and children, who are most affected by smoke-related illnesses.

Economically, the LPG sector is a job creator, generating opportunities in areas such as distribution, retail, and infrastructure development. Additionally, the affordability of LPG, driven by government policies, has enabled more households to adopt this cleaner energy source, improving their quality of life.

Despite these strides, challenges remain. Infrastructure expansion, particularly in rural areas, is critical to ensuring equitable access to LPG across the country. Many rural communities still rely on traditional fuels. This underscores the need for targeted awareness campaigns, to educate citizens about the benefits of LPG and dispel safety concerns.

Looking ahead, continued government support will be essential. Policies that encourage investment in LPG infrastructure, coupled with public-private partnerships, can accelerate the sector's growth. Scaling up initiatives like the LPG Growth Strategy will ensure that the benefits of this clean energy source reach even the most remote corners of the country.

With strong government backing, supportive policies, and growing public awareness, LPG is poised to play a central role in Kenya's energy future. As the country embraces this cleaner fuel, it takes one step closer to a brighter, healthier, and more sustainable tomorrow.



The Energy Transition: A Journey through The Phases



By Dr. (Eng.) Joseph Oketch

Allow me to introduce this topic of Energy Transition from my own experience. I used to work for the Kenya Power and Lighting Company (KPLC) that was the only power utility company in Kenya until the unbundling of the Kenyan Electricity Sector was introduced through the Electric Power Act of 1997 and further unbundling through the Energy Act of 2006. KPLC then had a policy to promote uptake and safe use of electricity in Kenyan homes. One of the policy initiatives was through a popular live cooking TV show, ‘Mke Nyumbani’ (translated in English as, “wife at home”) that was aired every Sunday on the only TV station then; the Kenya Broadcasting Corporation (KBC). Mrs Alice Tabuu who was the presenter of Mke Nyumbani was actually an employee of KPLC based at their then Demonstration Centre at the ground floor of Electricity House along Harambee Avenue in Nairobi. The objective of the live TV cooking show and the Demonstration Centre was to give cooking classes as well as teach people how to safely use electricity and electrical appliances in a proper way in their homes.

The other initiative targeted KPLC staff to be examples of what the ‘Mke Nyumbani’ TV show was teaching and promoting by granting them interest free staff loans to buy home electric appliance with a further incentive of a special electricity staff tariff (Tariff F5) that was only one third of the tariff the other domestic consumers were paying. As a patriotic and faithful employee, I fully utilized this later initiative and purchased an electric cooker, fridge, microwave etc. My wife, an Utali College trained hotelier and enthusiast of the “Mke Nyumbani”, followed suit and fully adapted electricity for cooking every family meal, including githeri that was our favorite for family lunch on Saturday after Sabbath worship.

In 2008, when the second unbundling in the Kenya Electricity Sector was operationalized, several new State Corporations were created with several job opportunities. With the desire to climb the professional ladder faster, I applied for the openings and profited by getting a managerial position at the then Rural Electrification Authority (REA); the predecessor to the Rural Electrification and Renewable Energy Corporation (REREC).

I therefore resigned from KPLC to take up the new job offer.

Upon exiting KPLC, we got our greatest family shock when our monthly electricity bill increased by 200% that month. My first instinct was to suspect a billing error and I did not waste time scrutinizing the bill details. I therefore called my former colleagues at KPLC and requested them to identify and correct the anomaly. I even hastened their resolution of the complaint by sending them our meter readings as at that morning because I knew it was one of the things they would require. Their feedback awakened and reminded me that I was no longer a staff at KPLC, because that extraordinary rise in our monthly billing was just because I was removed from Tariff F5 and placed under Ordinary Domestic Consumer Tariff where I rightfully belonged after exiting KPLC’s employment.

That evening, I broke the news to my wife and after thorough analysis of our income and other competing needs, we agreed that this new monthly electricity bill could not be accommodated within our balanced family budget. We were therefore forced to immediately carry out an exhaustive audit of our electricity consumption elements and strategize how to change our home energy mix through what in technical terms is called “Energy Transition”. Smil (2017), defined Energy Transition as the change in the composition of or structure of primary energy supply, the gradual shift from a specific pattern of energy provisions to a new state of an energy supply arrangement, which totally agrees and explains what we were forced to go through at our household level.

We did this by assessing what other energy sources were available for our various energy requirements, their costs, convenience, sustainability and requirements for adoption. Finally, we introduced LPG for most of the family cooking, charcoal for cooking githeri and barbecue, changed all lights including security flood lights to energy saving bulbs, instant showers instead of the electric boiler tank and controlled use of other electric appliances. This family Energy Transition and the forced change in my family lifestyle left me with a bitter experience that I have had over the years.

As I settled in my new job at REA, the bitter Energy Transition



kept lingering in my mind. This raised several questions and thoughts on electricity cost in Kenya, and what could be done to make it affordable to the average Kenyan. Now that our mandate at REA was to take electricity to the rural areas of Kenya where family incomes were much lower, it disturbed me more how they were going to uptake the electricity through the several electrification projects we were rolling out. This same fear could have influenced the REA management team that crafted their first strategic rallying call, “Lighting Up Rural Kenya”; that stressed more on electricity for lighting than for socio-economic transformation that was in REA’s mandate.

Two years later, I left REA and joined Energy Regulatory Commission (ERC); the precursor to Energy and Petroleum Regulatory Authority (EPRA). My personal bitter experience with household ‘Negative Energy Transition’ (allow me to explain positive and negative energy transitions in my next episode) and the experiences of ‘lighting rural Kenya’ with very minimal electricity uptake in the rural homes came to play when I found myself in a team reviewing KPLC electricity tariffs. I shared with the ERC tariff review team these personal

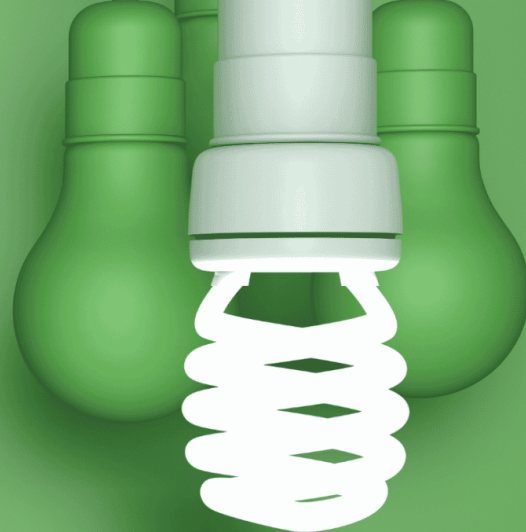
experiences and how the many rural electrification projects the government initiated with assistance of development partners had very little impact on the overall electricity demand creation and socio-economic transformation in the rural areas due to affordability of the electricity.

To conclude this introductory episode, the end product of the first tariff review I participated in at ERC came up with an enhanced ‘life-line tariff’ that targeted the very low income (or very low electricity consuming) domestic customers that were mostly in the rural areas and peoples’ settlements (slums) in urban centers. Another notable outcome of this tariff review was the scrapping of the KPLC staff tariff F5. This was after an attempt to expand that tariff F5 to include all staff in other public energy utilities including ERC failed due to lack of necessary justification and its effects on the sector revenue requirements.

Energy Transition series continues in the next episode.

The writer is the Director of Electricity and Renewable Energy at EPRA

Discourse on Energy Efficiency Trends in Kenya



By Ronald Ketter, Eustace Njeru, and Ignatius Chirchir

For some time, energy efficiency had been relegated to the back burner in sustainability discussions. This is despite the fact that inefficient use of energy leads to both financial and environmental costs, in micro and macroeconomic space. It is essential to reduce the energy used to produce goods and services. This is an easier path of reducing costs of production and related emissions and the capital cost requirements for construction of new power plants. Kenya has been on the correct path to achieve some of its energy efficiency goals. It is signatory to international treaties and has developed national policy instruments and strategies towards this.

Sustainable Development Goals (SDG) number seven (SDG 7) for example, is an international treaty that seeks to ensure universal access to affordable, reliable, sustainable and modern energy. To achieve this goal, several targets were prioritised, key among them being, increasing substantially the share of renewable energy in the global energy mix and doubling the global rate of improvement in energy efficiency by 2030. Through doubling the global rate of improvement in energy efficiency, energy consumption can be reduced while maintaining the same level of energy services. Energy efficiency will therefore make energy more affordable and accessible, bringing other benefits that extend across several SDGs.

The Paris Agreement of 2015, signed by 196 parties, is a legally binding

international treaty on climate change that seeks to limit increase in the global average temperature to well below 2°C above pre-industrial levels, while pursuing efforts to limit the temperature increase to 1.5°C above pre-industrial levels. Parties agreed to reduce the Green House Gases (GHG) emissions and pursue climate-resilient economic and social development pathways. The Agreement works on a five-year cycle of increasingly ambitious climate action carried out by Parties. Kenya, being a signatory to this Agreement, submitted its first Nationally Determined Contribution (NDC) in 2016 and an updated NDC in 2020. In the updated NDC, Kenya has committed to abate its GHG emissions by 32% by 2030 relative to the business-as-usual scenario of 143 MtCO₂eq.

Energy efficiency is considered the “first fuel” in clean energy transitions, as it provides one of the quickest and most cost-effective CO₂ mitigation options. Improving energy efficiency together with electrification, behavioural change and digitalisation will have a great impact in reducing the global energy intensity. It is for this reason that energy efficiency is currently gaining a strong global focus among policy makers in recognition of its important role in enhancing energy security and affordability, and in accelerating clean energy transitions.

The energy sector is responsible for three-quarters of global emissions, and transforming it is critical to tackling the climate change. 133 parties at the UN’s COP28 held in Dubai in December 2023 committed to the Global Renewable and

Energy Efficiency Pledge, that seeks for an integrated strategy and international cooperation to combine energy efficiency with renewable energy. The parties committed to doubling the annual average rate of energy efficiency improvements to 4% by putting energy efficiency at the core of policymaking, planning, and major investment decisions. Promotion of renewable energy without enhancing energy efficiency on both the supply and demand sides could result in energy waste and continued reliance on fossil fuels. The combined approach of increasing renewable capacity and enhancing energy efficiency is crucial for reducing dependence on fossil fuels and achieving a cost-effective transition to renewable energy. Improving energy efficiency lowers the total demand for energy resources allowing for an increase in the proportion of renewables in the energy mix, thereby decreasing environmental impact caused by energy production and consumption. This will enhance energy security by making energy systems more resilient and less dependent on fossil fuels.

The global energy efficiency rates, according to IEA, improved by 2% in 2022. That was double the speed of gains the previous five years, but slowed to a 1.3% improvement in 2023. In terms investment growth in energy efficiency-related measures in 2023 there was a reduction in growth from 16% in 2022 to 4% in 2023 reaching USD 624 billion in investments. Under current expected and announced policies, efficiency-related investment is projected to rise by a further 50%, to almost USD 910 billion per year by 2030. However, these

levels are still around half of the energy efficiency-related investment needed in the second half of the decade to realise the Net Zero Scenario goals of over USD 1.8 trillion in 2030.

According to IEA's Net Zero Scenario, the doubling of energy efficiency improvement from 2% to 4% per year would reduce global energy-related CO₂ emissions by almost 11 Gt CO₂ in 2030. In addition to energy savings and carbon emission reductions, other benefits would accrue from continuing to increase energy efficiency. Around 12 million new jobs would be created on the energy demand side by 2030 to achieve the efficiency improvements laid out in the IEA's Net Zero scenario. This includes mostly high and medium skilled workers in the professional, construction and manufacturing sectors to support renovations and new buildings, electric vehicle deployment and energy management.

Electrification holds a great potential to reduce final energy demand given that electric technologies are generally much more efficient than fossil fuel-based alternatives. The electrification of sectors such as transportation (electric vehicles) and heating (heat pumps) is leading to more efficient energy use, especially when combined with renewable energy sources. Fully electrified energy systems can cut final energy consumption by up to 40%. In 2023, electric vehicles (EVs) accounted for about 18% of all new vehicles sold globally, up from 14% in 2022. This trend is expected to accelerate further given governments policies, incentives and the cost competitiveness of EVs. Whereas the global heat pumps capacity additions in 2023 fell by around 3% compared to 2022, China saw a 12% increase. Technologies such as heat pumps and EVs not only shifts energy use to electricity that is increasingly coming from clean energy sources but also uses much less final energy than a conventional car or gas boiler to do the same job.

Green hydrogen is also emerging as a promising clean energy carrier that could be utilised in hard to abate sectors. Hydrogen can be used directly as an

energy source or can be transformed into 'hydrogen carriers' such as ammonia and methanol. Green hydrogen can produce high-temperature heat to power industrial processes—all while emitting zero greenhouse gases. Hydrogen can also be utilised in transportation, power generation and heating buildings. There are ongoing efforts to improve the overall efficiencies of green hydrogen production and conversion technologies.

The Energy Act 2019 mandates Energy and Petroleum Regulatory Authority (EPRA) to develop and implement national energy efficiency and conservation programmes. The Authority executes this mandate through regulations and initiatives on energy management targeting designated high energy consuming facilities, and establishing minimum energy performance parameters for key appliances. The Energy (Energy Management) regulations, 2012, requires facilities consuming more than 180,000 kWh of energy to conduct energy audits at least once every three years and implement the identified energy saving measures, among other obligations. The Authority has executed this mandate in close collaboration with Ministry of Energy and Petroleum and Kenya Association of Manufacturers (KAM) through its Centre for Energy Efficiency and Conservation (CEEC). This close working relationship with the KAM-CEEC has contributed to increasing awareness and uptake of energy management programs among industry players.

The Authority, through the Energy (Appliances' Energy Performance and Labelling) regulations, 2016, has established minimum energy performance standards (MEPS) for appliances such as household refrigerators, non-ducted air conditioners, three-phase induction motors and general service lamps. The MEPS ensures that the least efficient appliances are excluded from the market while the labelling program provides consumers with accurate and comparable information on the appliance's energy efficiency performance. This enables consumers to make informed decisions when purchasing these appliances.

There still exists a significant potential to improve energy efficiency rates in Kenya especially among the designated facilities as well as through setting of MEPS for more household appliances. The Authority is in the process of reviewing the two regulations with a view of incorporating additional regulatory tools such as establishment of energy benchmarks for various sectors, establishment of a framework governing operations of Energy Savings Companies (ESCOs), among others. The adoption of these revised regulations is expected to revolutionise the energy efficiency sub-sector in Kenya, enabling the country to fast-track the achievement of its obligations under the Paris Agreement.

Despite the high benefits and low cost of energy efficiency as a major solution for reducing cost of production as well as mitigating climate change, a large number of energy efficiency opportunities remain untapped due to multiple barriers key among them being limited technical skills and inadequate financing. The establishment of ESCOs in Kenya is expected to unlock the potential for implementation of energy efficiency projects through provision of structured financial products and technical expertise to the facilities. ESCOs will therefore play an important role in boosting private investments in the implementation of energy efficiency projects. The establishment of a Super ESCO by KPLC to address both public- and private-sector opportunities for ESCOs will also help in fostering the growth of ESCO industry in Kenya. It is expected that the Super ESCO will facilitate the development and implementation of energy efficiency projects (including the financing) but subcontract implementation to private-sector ESCOs. The public sector entities have generally lagged its private sector peers in undertaking energy efficiency projects and KPLC's Super ESCO could play an important role by establish a revolving fund to support implementation of these projects.

The writers work at the Energy Efficiency Department at EPRA

Energy Storage Technologies: An Improvement in The Adoption of Renewable Energy Sources

By Abraham K. Kisang

The government has made sustained efforts to ensure accessibility to electricity in underserved regions. Despite these efforts, some households in rural Kenya still live without electricity. Demand for electricity and quest for universal energy access thus implies that the government has to explore alternative ways of increasing electricity accessibility. Renewable energy plays a key role in sustainably achieving this objective.

The Kenya Energy Transition & Investment Plan for 2023-2050, emphasizes that renewable energy is key to net zero carbon emissions. This suggests that to increase the share of electricity from these sources, Governments and private sector adopts energy storage technologies. Energy storage systems such as batteries can store excess energy produced during peak hours. This energy can be used during low generation periods.

Renewable energy resources like solar and wind are intermittent in nature. Energy storage infrastructure therefore, can be used to enhance their uptake in rural areas. This can be done through the development of mini-grids and use of plug and play solar systems. Through these initiatives, rural areas will gain reliable and affordable electricity, which in turn drives social, economic and environmental benefits.

Battery storage initiatives can be best-achieved using evidence based government policy interventions. The evidence in this case is informed through techno-economic feasibility studies. Currently, the country is undertaking one such study to determine the viability of grid battery energy storage system. This study is part of the Kenya Green and Resilient Expansion of Energy (GREEN) program. Such studies should however be extended to cover systems like solar mini-grids, which are essential in improving access in remote areas.

The writer is a Regional Manager at EPRA



Leveraging The Oil And Gas Value Chain To Harness Opportunities In The East Africa Neighbourhood

By James Ochieng

While Kenya still grapples with the viability of its oil reserves through the review of the Field Development Plan (FDP), the neighbor's horse in Uganda has already bolted from the stable. Uganda is planning to commence oil production this year (2025). The outcome of the review of the FDP is not known at this point and even if the plan would be certified viable, actual production could take many more years to come. This is because of the technical, legal and commercial complexity of oil production.

According to the Petroleum Authority of Uganda, the Uganda's Albertine basin holds an estimated 6.5 Billion barrels of oil with 1.4 Billion barrels estimated to be recoverable. Gas resources are also estimated at 600 Billion Standard Cubic Feet (SCF).

On the southern part of Kenya, lies Tanzania where according to the Energy and Water Utilities Regulatory Authority (EWURA), as of the year 2016, the parent government Ministry in charge of Energy and Mineral resources, confirmed 57.25 trillion Standard Cubic Feet (SCF) in Natural Gas Reserves.

Sometime in 2017, the Embassy of the United States of America in Uganda, while targeting American investors, published in its website about the opportunities that existed for ancillary services in the Ugandan oil and gas sector. The communication stated that; "with upstream and midstream projects currently under front-end engineering and design, international oil companies are increasingly looking for service subcontractors including housing, road infrastructure design and construction,

environmental hazard controls, and vocational training services."

The website further encouraged American investors interested in bidding for some of the available contracts to tender their bids through the Directorate of Petroleum's website, which was also posted in the communication for effect.

This interesting siting of business opportunities for American investors who are miles away confirms availability of myriad of options for next door neighbours interested in leveraging on the Ugandan oil boom and the Tanzanian natural gas discovery further south.

Kenya can position itself as an ancillary service provider in the petroleum and gas value chains in the neighboring countries, due to its strategic position in the horn of Africa. The concept can be borrowed from Germany, Belgium, Italy, Poland, Netherlands, Canada, USA and a host of many other countries in Europe. These countries are the leading exporters of chocolate, a product of Cocoa beans, despite not harvesting cocoa beans from a single European or American Cocoa tree if any exist.

Further across the Atlantic, a German-American Levis Strauss moved from New York to the West Coast of America and started manufacturing tents and jeans and later invented the now famous reverted hardened Levi's blue Jeans that would withstand harsh environmental conditions. This denim targeted coal miners, cow boys and American farmers.



Levis Strauss was not directly involved in mining or farming but leveraged on the need of these groups to invent and advance a product that they needed. Neither is Germany et al directly involved in farming of Cocoa but have produced award winning chocolates from Cocoa beans imported miles away in West Africa. To put it in context, Germany, the world leading producer of chocolate exported \$5.6 Billion worth of chocolate in 2022.

These two examples give perspective to what Kenyan investors can do with the opportunities that abound in the oil and gas sector in not only Uganda and Tanzania but also in South Sudan and later Somalia where there are prospects for oil discoveries in the Indian Ocean coastline. The advantage for Kenyan entrepreneurs is greater, leveraging on the East African Community ties that comes with ease of labour, capital migration, less stringent non-tariff barriers and proximity as compared to other competing countries like the United States of America.

The opportunities are not limited to big projects and can span from manufacturing, hospitality, transport, financial services, medical, agriculture, education, consultancy among others. With a massive number of highly educated youth, a greatly entrepreneurial citizenry, a bigger economy and better infrastructure, Kenya can be a hub for ancillary services in the oil and gas industry in the region without necessarily being a producer of any of these resources.

Proximity to the regional oil and gas producing countries and favourable geographical location present a perfect fit for the role that Kenya can play in this space.

With purposeful and directed government policies that support investment, labour and capital migration, the country will have positioned itself as the regional hub of the oil and gas industry and viability of its own oil production will only complement and cement an already existing value chain and ancillary services.

The country will still be able to enjoy the benefits of reduced cost of oil through reduced logistics and economic transformation as compared to procuring oil from far-flung Middle East as is currently the case in the event that its oil prospects run into unforeseen headwinds.

It is hoped that the neighbouring oil and gas producing countries will not apply an exclusionist policy but will instead allow Kenyan investors and entrepreneurs access to the opportunities which will come with oil and gas production in these countries. The Kenyan entrepreneur will also be expected not to abuse the privilege and goodwill extended by replicating the “Black Gold of Chepkube” phenomenon or other vices. Instead, ethical business practices will determine the success or failure of these opportunities.

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An Outlook Of The Energy Sector In 2024

Geothermal top in Kenya's energy mix

Geothermal energy accounted for the largest portion of Kenya's installed capacity at 26.37% as at June 2024. Hydro and thermal power followed, with 24.38% and 17.78% respectively. Solar photovoltaic systems and wind generation stood at 12.38% and 12.19%. At the same time, Kenya's interconnected capacity decreased by 73.5 MW, bringing the total to 3,199.9 MW, due to the expiration of the Power Purchase Agreement for the Kipevu 1 power plant. No new grid-connected power generation plants were commissioned during this period. However, the Sossian geothermal power plant began full commercial operations in October 2023, strengthening power supply and improving reliability in the Central Rift region

Geothermal energy leading source of electrical power in 23/24 period- industry report

Geothermal energy remained the leading source of electrical power in the country, generating 5,707.71 GWh, which accounted for 41.7% of the total electrical energy produced for the year ending June 2024. This represents a decrease of 328 GWh from the 6,035.00 GWh generated in the previous year, when geothermal energy accounted for 45.4%. The reduction is partly due to the decommissioning of the 45 MW Olkaria I power plant and an increase in hydro generation and electricity imports during the period. Hydro energy contributed 24.7% of the total electrical energy generated, producing 3,377.58 GWh. This marks an increase of 808.4 GWh compared to the 2,569.18 GWh generated in the previous financial year, when hydro energy accounted for 19.3% of total generation. The rise is attributed to improved hydrology, due to heavy rains in October-December 2023 and March-May 2024.

Wind energy's share of the generation mix decreased to 13.1% from 16.6% in the previous year. Gross wind generation fell by 403 GWh, from 2,201.72 GWh in the previous year to 1,798.59 GWh. This decline is attributed to lower wind speeds, which were a direct consequence of the prolonged rainy seasons. Electricity imports rose significantly to 1,199.80 GWh, accounting for 8.8% of total energy, up from 644.07 GWh and 4.86% of gross energy in the previous year. Thermal generation declined to 8.2% of the total energy generated in the year ending June 2024, compared to 10.52% the previous year.

In absolute terms, thermal generation decreased by 268.38 GWh, from 1,395.49 GWh in the year ending June 2023 to 1,127.11 GWh in the year ending June 2024. This decline is attributed to a shift towards prioritizing renewable energy sources over thermal power.

Nairobi region top in energy consumption

Nairobi region emerged as the leading consumer of electrical energy, utilizing 4,571.78 GWh, marking the highest consumption nationwide. This constituted 43.7% of the country's total energy consumption. The region, which includes Kiambu, Kajiado, Machakos and Makueni counties, stands out with its dense concentration of large and medium industries, micro and small enterprises.

The Coast region ranked second in energy consumption, utilizing 1,916.68 GWh, which constituted 18.3% of the country's total energy consumption. The Rift region accounted for 13.67% of the total consumption, utilizing 1,431.23 GWh, followed by North Eastern and Mt. Kenya regions contributing 10.7% and 6.5% to the overall consumption respectively. West Kenya and South Nyanza regions reported the lowest consumption percentages, representing 5.31% and 1.92% of the total consumption respectively.

Electricity reliability indices stay within regulatory targets

Reliability indices are metrics that measure the reliability of a power system. They give a measure of how often power supply is interrupted and for how long the interruption lasts. These indices are the Customer Average Interruption Duration Index (CAIDI), System Average Interruption Duration Index (SAIDI) and System Average Interruption Frequency Index (SAIFI).

During the period under review, The CAIDI averaged 2.53hrs in the year 2023/24 as compared to 2.25 hours per month in the previous financial year. This was within the EPRA set target of 3.53 hours per customer for the Financial Year 2023/2024 in the 4th tariff control period.

The SAIDI for the period under review averaged 10.14 hours per month. This is an increase from the 8.37 hours recorded in the year ended June 2023. This exceeded the EPRA target of 5.00 hours stipulated in the 2023/2024 tariff control period. The longest outage averaged 17.29 hours in April 2024 while the shortest outage averaged 5.53 hours.

The SAIFI for the year ended June 2024 was 3.96 interruptions per customer as compared to 3.75 interruptions per customer in the year ended June 2023. This exceeded EPRA's target of 2.15 interruptions per customer for the 2023/2024 tariff control period. Interruptions were most frequent in April 2024, with 5.03 interruptions per customer while July 2023 had the least number of outages.

Volume of export petroleum products and domestic kerosene marked soars from last year

Overall, the total volume of all export products and domestic kerosene marked across all loading facilities increased by 11.7%, rising to 3,609,915,872 liters compared to 3,230,659,914 liters

marked in the previous financial year. Of this, export/duty-free motor fuels accounted for 3,561,548,557 liters (98.7%), while domestic kerosene accounted for 48,367,315 liters (1.3%). Export volume marked during the year grew by 13.5% compared to the previous year. The significant growth of export volumes was attributed to factors such as distinctive logistic cost efficiencies on the Kenya transit corridor, robust infrastructure and a robust fuel marking and monitoring program, which guarantees product integrity.

The domestic kerosene volumes marked declined by 48.2%. The significant decline was attributed to the reduced demand for industrial and domestic use, as more consumers transition to alternative fuels. The decline is also attributed to the anti-adulteration levy, enhanced monitoring by EPRA of kerosene released from all terminals and a robust fuel marking and monitoring technology that effectively deters dumping of export fuel.

LPG Compliance

During the review period, EPRA conducted 108 bulk inspections of LPG road tankers, achieving an average compliance level of 80.50%. Additionally, EPRA carried out 1,680 inspections at wholesale and retail sites, with an average compliance level of 52.45%. It also inspected two LPG cylinder manufacturing and revalidation plants, which had an average compliance of 73.05%. The Authority also performed 66 audits and 66 re-evaluation inspections of LPG storage and filling facilities across the country.

Biomass Is Growing Popularity In Domestic And Industrial Consumers In Kenya

By Purity Muse

Kenya has recently seen a shift towards biomass energy, a trend powered by the need for sustainable energy solutions amidst rising energy costs and the global imperative to address climate change. Biomass is an appealing energy source for Kenya domestic and industrial consumers due to its affordability, accessibility and alignment with environmental goals. This growing popularity of biomass energy, particularly in rural and semi-urban areas, is transforming Kenya's energy landscape.

Biomass accounts for about 70% of Kenya's primary energy consumption. Most of it is domestically used for cooking and heating. Many facilities have adopted biogas, which is a form of biomass. It offers significant advantages over firewood in terms of health, environment sustainability, economic savings and efficiency.

In Kenya's industrial sector, biomass is fueling facilities like sugar and tea factories. Other manufacturing facilities like milk manufacturers are replacing fossil fuels boilers with biomass boilers. This shift has reduced energy cost by about 30%. This is compelling economic incentive while also helping companies meet environmental targets necessary for international certifications.

The use of biomass energy in Kenya faces challenges, including resource depletion risks and the high initial cost of setting up biomass processing facilities. Overexploitation of biomass resources without replanting of trees could exacerbate environmental degradation. However, the government and private sector have recognized these challenges and are working on sustainable biomass production practices. These include but not limited to policies focusing on reforestation and efficient fuel production technologies.

The future of biomass energy in Kenya looks promising, as we continue to explore sustainable and renewable energy sources. With its extensive adoption in households and industries alike, biomass could soon become a cornerstone of Kenya's energy strategy. This can provide a model for other African countries seeking to transit into renewable energy sources. The growing preference for biomass is a testament to the potential of homegrown energy solutions. This will address pressing economic and environmental challenges while reinforcing Kenya's commitment to building a more resilient, sustainable energy future.



Emerging Trends Shaping The Future Of Renewable Energy

By Kevin Ohuru

The renewable energy sector is growing and evolving, thanks to technological advancements, policy changes and an exponential growth in the demand for clean energy. The International Energy Agency (IEA) has predicted that energy consumption in the power, heat and transport sectors will grow by 60% in the next 6 years. The industry's evolution is showing no signs of slowing down with numerous trends coming up that are bound to define the sector's future.

The integration of renewable energy sources like wind, solar and hydropower into hybrid power systems is becoming commonplace all over the world. Hybrid power systems offer increased stability and reliability by covering for the periodicity of independent sources. Such systems take into account the fact that individual energy sources peak at different times and so they utilize sophisticated energy storage equipment and advanced control systems to optimize performance.

Another emerging trend is the Floating Photovoltaic (FPV) system: this is the installation of solar panels in the sea or other large water bodies like lakes and

reservoirs. There are benefits to the adoption of FPV such as reduction in land use and an improvement in panel efficiency due to the cooling effect of water. These systems are well suited to areas where water resources are abundant but land is limited like Hong Kong, Singapore and the island nations of the Pacific.

Green Hydrogen is becoming important as an energy storage medium. It has varied applications particularly in power generation, transportation and powering industrial processes. It is produced through the process of electrolysis, which involves using electrical power, from renewable energy sources. There is no carbon emission in electrolysis. There is great advancement in electrolysis technology, which has reduced the cost of production of green hydrogen making it a viable and competitive energy source.

Proper energy storage is key in improving the stability and reliability of renewable energy sources such as solar and wind. Lithium-ion batteries are currently the best solution, but other alternatives like flow batteries are coming up. Flow batteries provide longer-duration and scalable storage making them better suited for power grid applications.

The seamless integration of renewable energy sources into existing power grids is central to a successful energy transition. Smart grids with advanced communication technology, sensors and data analytic software; have enabled the efficient distribution and management of renewable energy. These 'new' grids offer enhanced stability, optimization of energy flow and allow real-time monitoring of the entire system.

Artificial Intelligence (AI) is becoming crucial in increasing the efficiency of renewable energy systems. Optimization of grid management, forecasting of energy production and demand levels as well as prediction of maintenance needs have all greatly improved by the adoption of AI.

These emerging trends are transforming the renewable energy sector and accelerating innovation. Embracing these technologies will fast-track the energy transition and ensure a cleaner more sustainable energy landscape.

The writer is a banker at Dyer & Blair

Interrogating Sustainability Of Carbon Credits As A Climate Mitigating Measure

By James Ochieng

The climate change debate has overshadowed the broader issue of sustainability: creating the impression that climate is the only problematic environmental issue bedeviling humanity. We less often make enough noise about overall sustainability and have instead been focusing on climate change, which while a primary component, is not the only sustainability challenge today the humanity faces today. Sustainability transcends all strands of human existence and demography. It relates to optimal resource management, distribution and the resultant effect on social, political, environmental and economic considerations.

Commercialization and sensationalizing of the climate change challenges is a risk that needs to be mitigated. The overdrive towards gains and profits on climate change is in itself a precursor to environmental conflicts that climate change mitigation is meant to resolve.

Different mitigation measures have been proposed but some of them, if not sustainably managed portends risks and dangers to communities whose interests these measures are supposed to safeguard. Talk of the cobra effect. Key among the climate change mitigation measures are those resulting in compensating for carbon credits and the resultant benefits that accrues from it. The systems for monitoring emissions and quantifying reduction of carbon dioxide equivalent from the atmosphere and how this is achieved varies.

Carbon credits can be abused to the detriment of the very environment it is supposed to protect and the people

more vulnerable to degradation. Greenwashing can be used by companies to misinform or mislead the public in the quest for carbon credits. Some companies have implemented the so-called green technologies that are practically not able to sustain their operations or alternatively making their products expensive and out of reach of the very people who are victims of climate change.

In pursuit of carbon credits, some of these companies would compensate by transferring their operations to less stringent jurisdictions to overshadow the damage done by the company while implementing climate compliant practices in areas of more stringent scrutiny. Such companies claim carbon credits in these areas of operations to capitalize on the demand for environmentally friendly products.

Companies have also been known to claim misleading inventions in solving environmental challenges to push sales. The German car manufacturer of Volkswagen vehicles was found to have cheated in their vehicle emission tests projecting their car emissions as low. In what has been called the 'diesel dupe' the vehicles were fitted with a software known as the "defeat device" that was programmed to detect testing of diesel engine emissions and capable of changing engine performance to the desired test outcome.

Another common example is the hotel industry notices in rooms for environment conservation where customers are encouraged to use water sparingly and also make a choice to re-use towels and beddings. While the customers end up paying the same cost for these services, the hotels make savings

in laundry, electricity and water bills and also claim carbon credits in some cases without transferring the same benefits to the customers.

The unregulated carbon finance market and specifically vague emission trading mechanisms can open an avenue for corruption, tax evasion and money laundering. Developing economies carry the most burden in accommodating the world's carbon sinks. This mostly happens through the presence of vast forest covers.

In quest to benefit from these carbon sinks, there emerges conflict between conservationists and communities who rely on these forests for their livelihood. Those benefiting from carbon credits are bound to restrict or even displace communities around the forests. On the flipside, exaggerated reporting on carbon sequestration for commercial gains through forest covers and other vegetation and fictitious projects can result in cheating for carbon credits. Sustainability of tree planting as a form of carbon sink requires critical analysis in light of population growth and community conflict.

The push to earn carbon credit can result in worthless projects being certified. This can also lead to recycling credits or collusion between project developers and certifiers. More crucially, the obsession to earn from carbon credits may negate the all-purpose of conservation and turn a project into a money venture devoid of any ethical practices that are geared towards mitigating climate change.

The writer is the Manager, Accounts at EPRA.

Aligning Business Success With Environmental Stewardship

By Gladys Njoroge

Peter Drucker, a visionary in management theory, astutely observed that a business's success is intricately tied to the health of the society in which it operates. This insight underscores a crucial reality: businesses are not isolated entities but integral components of the broader societal ecosystem. A thriving business must therefore align its operations with the well-being of the environment and the community it serves.

In today's market, a significant shift in consumer priorities is reshaping the business landscape. Beyond the traditional considerations of price and quality, customers are increasingly prioritizing a company's values, especially its commitment to environmental stewardship. This evolving consumer awareness demands that businesses, particularly in high-impact sectors like energy, adapt their practices to align with broader societal and environmental goals. In the petroleum sector, a major consumer of environmental resources and emitter of carbon, this shift represents both a challenge and an opportunity.

Energy efficiency emerges as a crucial area where the sector can make a meaningful impact. Petroleum companies must adopt comprehensive energy-efficient practices, including the procurement of advanced, energy-saving appliances, the construction of eco-friendly facilities, and the integration of energy-efficient protocols into daily operations. In addition, regular energy audits should become a standard practice to ensure that facilities are operating at peak efficiency. In Kenya, The Energy (Energy Management) Regulations 2012 and the Energy (Appliances' Energy Performance and Labeling) Regulations 2016 provide a framework for these efforts, guiding industrial, institutional, and commercial entities toward greater energy conservation and efficiency.

Beyond energy efficiency, the potential of renewable energy resources in Kenya offers a promising avenue for environmental conservation. Rather than viewing renewable energy as a

competitor to traditional sources, it should be seen as a vital complement that can foster growth and sustainability. Kenya is endowed with abundant renewable resources such as solar, wind, and hydro power. Leveraging these resources not only supports environmental conservation goals but also facilitates business diversification and enhances energy security.

The energy sector also plays a pivotal role in supporting Kenya's environmental objectives, particularly in terms of forest conservation. The government's focus and advocacy for tree planting and the conservation of water catchment areas underscores the urgent need for collaborative efforts in environmental stewardship. By aligning with these objectives, the energy sector can contribute significantly to a greener future.

The possibilities for environmental stewardship within the petroleum sector are vast. The sector has historically showcased remarkable engineering prowess, and it is time to channel similar innovation into environmental conservation. Investing in research and development focused on sustainable practices and environmental technologies can lead to ground-breaking advancements that benefit both the planet and the industry.

As Drucker's wisdom suggests, the health of society and business are deeply interconnected. For the petroleum sector, this means embracing energy-efficient practices, supporting environmental restoration initiatives, and harnessing the full potential of renewable energy resources. This will ensure petroleum firms can meet evolving consumer expectations, comply with regulatory standards, and contribute to a sustainable and prosperous future. In achieving this alignment, the sector can lead by example, demonstrating how business success and environmental responsibility can coexist harmoniously.

Editor's note: This article was first published in the Petroleum Insight Magazine.

Is Supply-Demand Disparity Derailing The Global Energy Transition?



By Oliver Kilonzo

From Urban dwellers switching to electric vehicles to rural households ditching charcoal for LPG, there is no doubt that the shift to sustainable energy sources is in full swing. The world is in the midst of an energy transition, shifting away from fossil fuels towards cleaner, more sustainable sources. Demand for renewable energy sources such as solar, wind, hydro and geothermal is on the rise. However, the rapid increase in demand for clean energy is straining the supply chain, leading to a situation where demand is outgrowing supply. This shortfall has significant implications for the future prospects of the energy transition and the fight against climate change.

What is driving this demand?

Several factors are contributing to the surge in demand for renewable energy. Primarily, climate change and its impact on daily lives has laid bare the urgent need to take corrective action. Governments, businesses, and individuals are now looking to lower their carbon footprint, leading to greater adoption and thus greater demand for renewable energy.

Furthermore, the overall cost of renewable energy, especially wind and solar, has reduced considerably over the last five years, making them more competitive with fossil fuels. The International Renewable Energy Agency (IRENA) reported that around 86% of all the newly commissioned renewable capacity in 2022 had lower costs than fossil fuel-fired electricity. This cost-effectiveness has caused more renewable energy adoption from both large-scale and retail consumers.

Lastly, many large companies have laid down very ambitious energy sustainability goals; some have committed to only use renewable sources for all their energy needs. Many corporations have been galvanized into doing this by a combined effort of pressure from activist groups as well as changes in regulatory policy by governments. This sustainability drive from the corporate sector has significantly raised the overall demand for renewable energy.

Supply challenges

The rapidly increasing demand for renewable energy has occasioned several supply chain challenges. The first is the difficulty involved in acquiring raw materials such as steel, aluminum, silicon and the rare earths used for the manufacture of various renewable energy equipment such as solar panels and wind turbines.

Second, the global manufacturing capability has not matched the pace of the growing demand for renewable energy. Given the time and resources required to scale up production, it is estimated that the gap between supply and demand could widen unless urgent and decisive measures are taken. The existing energy infrastructure, particularly in the electricity sector, needs to be expanded and upgraded to allow the smooth integration of renewable energy into the existing grids. Furthermore, the renewable energy sector is short of the skilled workforce needed to implement projects. The International Energy Agency's (IEA) Global Energy Transitions Stock take report 2024 estimates that the clean energy sector has created at least 5 million jobs worldwide since 2019, but this still falls short of the number required to match demand projections.

Humanity cannot afford to have the energy transition momentum disrupted. A National Aeronautics and Space Administration (NASA) report published on the Climate Adaptation Forum is projecting that the world will breach the threshold temperature of 20C by 2040. Necessary steps such as increased investment and more stringent regulations must be implemented to arrest the supply/demand disparity before it is too late.

The writer is a Treasury Officer at Bank of Africa-Nairobi

The Future of Oil and Gas in the Energy Transition

By Stella Opakas

The other day my friend was buying a lip care product from an online platform and one of the ingredient concerns was if it was petrochemical free. Where can one hide from the petroleum industry? She asked. Well apart from transportation and energy production, petroleum is used in agriculture -production of fertilizers and pesticides, detergents, plastics, dyes, paints, pharmaceuticals and synthetic rubber. At a glance, you would hardly find something in your environment that is not from the petroleum and natural gas industry. Just like my friend and her lipstick purchase, there is bound to be an increase of people in the world demanding these products.

The United Nations projects that the global population will increase from an estimated 8.03 billion in 2024 to 9.70 billion in 2050. It is certain that demand for these products will continue to grow leading to increase in energy demand. For example, according to the World Energy Outlook Report of 2018, the International Energy Agency projected that global energy consumption will increase by 27% in 2040, from 14000 to 17700 million tonnes of crude oil equivalent.

The petroleum and natural gas industry will play a major role in meeting this demand. This however, seems counterproductive to the contemporary debate on de-carbonization and energy transition. The energy transition discourse has placed the world at a flex point. On one hand, developed countries are advocating for and creating policies to de-carbonize their

economies whilst the global south is advocating for raising living standards through developing their natural resources.

Whereas the developed world focuses on transition to a decarbonized economy, the developing world leans towards energy accessibility and affordability. Therefore, it is vital for the developing economies to explore ways of using the petroleum and gas products to solve these transition challenges. This begs the question: does oil and gas have a future in these transition efforts?

It is possible for the petroleum and natural gas industry to carry out its activities in a manner that contributes to decarbonization efforts. There have been advancements in the use of these products. Industries are employing techniques such as: carbon capture and sequestration; recycling and re-use; and efficient use of petroleum products. These efforts notwithstanding, there is need for players in this industry to do more to ensure that petroleum and gas contribute to the development of the economy in a sustainable manner. The petroleum and gas industry have various interventions they can adopt to ensure sustainability. Some of these interventions include having renewable energy footprint in the petroleum and gas value chain. The renewable energy footprint include having renewable energy sources and climate engineering.

The Writer is the Deputy Director, Mid and Downstream Petroleum at EPRA

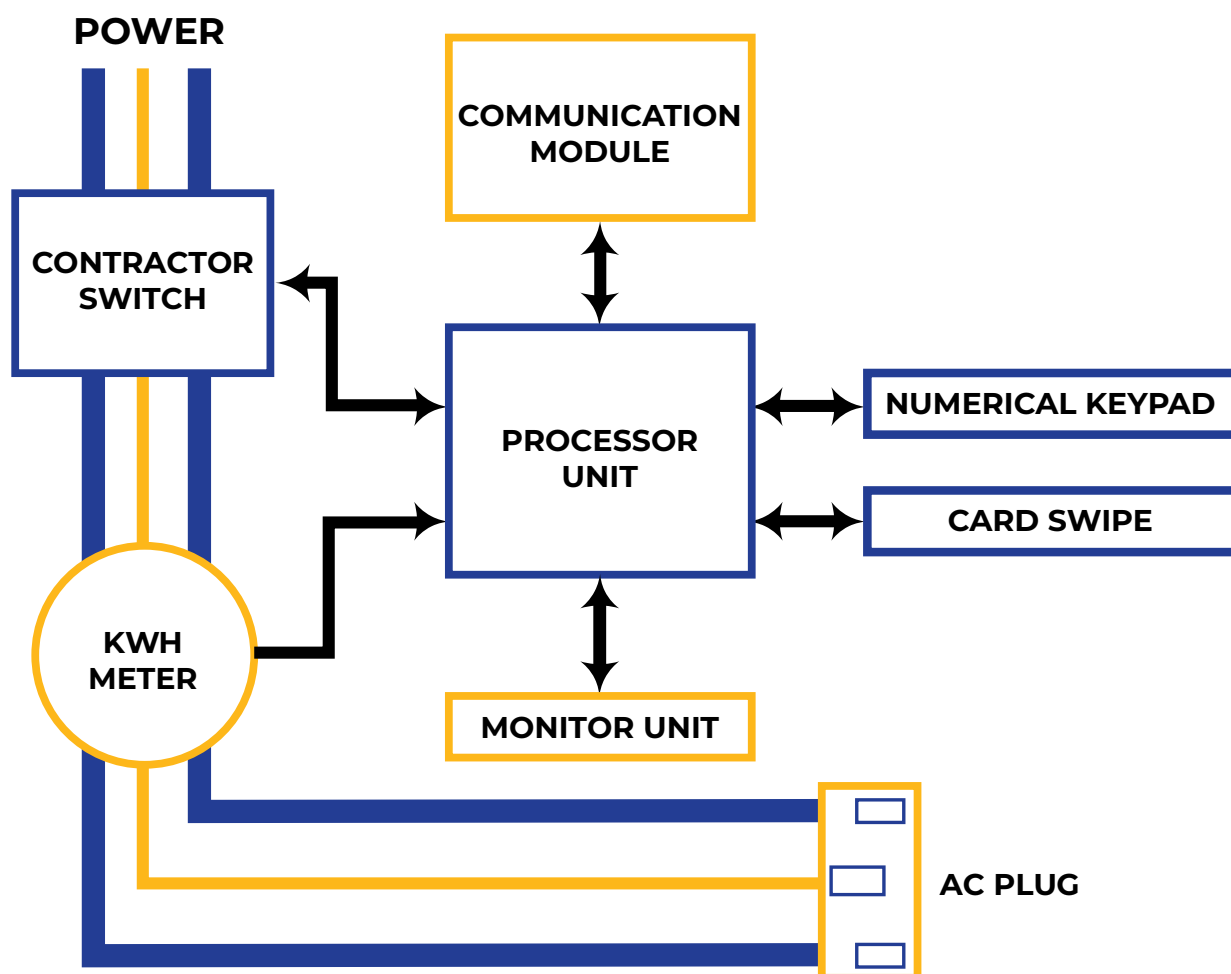
Progression of Smart Metering Technology for Electric Vehicle Charging

By John N. Njuguna

With an emerging campaign to green the transport sector, people have started to focus on shifting from Internal Combustion Engine (ICE) vehicles to EVs. This technology shift has occasioned emergence of EV infrastructure components like charging stations and smart meters. The Kenyan government is planning to construct 1000 EV charging stations. With this advancement, it is imperative that we look at viable technologies that will serve the purpose and sustain the dream of net zero emission in the transport sector: thus the dawn of the smart metering technology.

Smart metering just like in its application in other utilities, comes to ensure optimal usage of energy, ensure grid stability and provide Electric vehicle owners with a smooth charging experience while charging their vehicles.

To start off in understanding the pros and cons of incorporating smart meters in charging stations, it is better to understand their working principle. The question is, how are they effective in EV charging system?



Gautham Ram Chandra Mouli, Prasanth Venugopal and Pavol Bauer, "Future of Electric Vehicle Charging", 19th International Symposium POWER ELECTRONICS Ee2017, pp. 19-21, October 2017

A smart meter is a microprocessor-based technology. It consists of a programmerable processing unit, which is able to calculate energy usage, automatic control, data processing, and remote tracking of power outages. A concept, which ensures reliability of the grid.

Much can be said about the transformative impact that Smart meters have had on public charging points. Highlighting the advantages of Electric Vehicles in the views of economics and the environment. A greater benefit that has accrued to Charging Point Operators (CPO's) in Kenya is reducing the workload and ensuring convenience in terms of meter reading. They have also reaped in bigger portions as smart meters have enabled them to enjoy the various e-mobility tariffs. This has enabled them to purchase energy at Kshs.16 per kWh during peak hours and Kshs.8 per kWh during off-peak hours (10pm-5am).

How then does a smart meter complement the charging process?

Like any other charging depot, the charging process of an Electric Vehicle begins with the entry of the vehicle into the charging station. The charger connector then is plugged into the vehicle plug. When this happens, a status notification appears on the monitor to confirm connectivity. When a smart card is inserted, the user feeds for power they need, either in the form of money or kWh. It is within this period that diagnostics will be done to check on whether functionalities such as the batteries are in good condition. In case of any malfunction, the charging process will terminate to eliminate any risks.

In harmony with this, the smart metering technology ensures that safety concern of the user is paramount, guaranteeing that the hardware and software is user friendly. The block diagram of the charging process is as illustrated in figure 1.

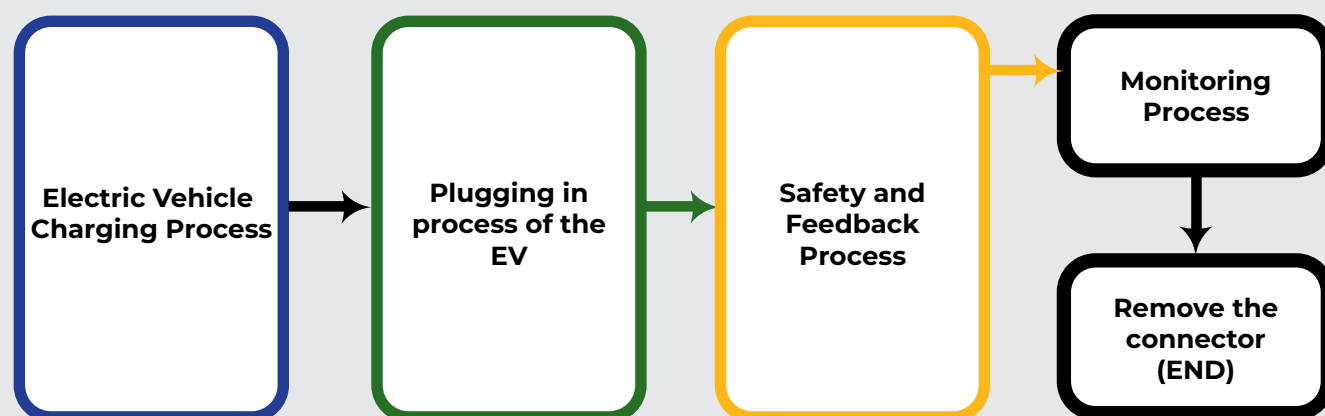


Figure 1: EV charging process.

The progress of EV charging infrastructure could well be supported by the smart metering technology. Remote control, real-time power measurement, power quality monitoring, ensuring effective demand response through V2G and V2B technologies are just some of the benefits of adopting this lucrative technology. With the increasing advancement of EV charging infrastructures, maybe then we can accelerate EV adoption in the quest of achieving Net zero carbon emission.

The writer is from the Technical University of Kenya

Strengthening The Regulatory Framework Of The Coal Sector In Kenya: A Path Towards Sustainable Energy

By Patrick Mutai

The use of coal as an important part of Kenya's growing energy strategy has come about as the country expands its energy mix to meet population demand and Vision 2030. The value realization question has been the subject of debate even when the government, which has many deposits particularly in Kitui County. The government has considered executing several coal related projects. This include the proposed Lamu Coal Power Plant. The policy framework for coal mining as well as generation of energy from coal in Kenya has a number of issues that may stick in the way of sustaining development. This article assesses the state of coal industry regulation today, documents gaps in sector governance, and provides specific recommendations for reform.

The policy framework overseeing coal mining in Kenya is mainly shaped by the Acts of Parliament: Mining Act of 2016; the Environmental Management and Coordination Act (EMCA) of 2015 and the Energy Act, of 2019. These legal instruments essentially define the basic framework of mineral extraction and conservation of the environment but do not have a detailed regulation on coal mining industry. Most of the provisions in the mining act ensures conservation of mineral resources that may not be application to coal extraction. Nevertheless, such aspects as greenhouse gas emissions and the destruction of the landscape receive insufficient attention.

The current legislation is not adequately covering the specific environmental impacts generated by utilization of the coal resources. For instance, the EMCA specifies general guidelines as to emissions and waste issues but does not specify requirements unique to coal operations.

A review shows that most EIAs for coal projects are not complete in identifying cumulative impacts, and the long term effects on wildlife and human health are also not fully considered. In this respect, the EMCA outlines essentially, general principles of environmental regulation in the context of the nation, while it exhibits a rather scanty detail as far as the coal industry is concerned.

The existing health and safety regulations do not account for the contingent risks involved in coal mining - particulate matter and the possibility of explosions, for example. Lacking a framework about safety in coal extraction implies that miners are unprotected, and health risks to them are exacerbated. Respirable crystalline silica from coal dust has been identified as a cause of chronic respiratory diseases by the International Labour Organization. As a measure to protect the health of workers, it is necessary to elaborate upon standardized health protection measures, in particular to the specific risks of the coal industry.

The analysis of the legal framework in Kenya reveals some shortcomings in community engagement. For instance, decisions regarding most mining activities and other resource extraction have witnessed limited engagement of local population in the past, in Kenya. This has been identified to cause conflict between mining companies and the communities where the land is used, as they claim to be paid damages to their environment.

Collaborative frameworks for bringing all stakeholders together should be emphasized to safeguard the interests and avoid litigation issues with these communities. Moreover, establishing hybridized structures for stakeholder engagement help the communities

affected by coal operations to voice their concerns. Generally, almost all communities in mining regions tend to suffer the consequences of environmental debasement as they do not have the required resources or the legal means to demand remediation. Therefore, it is necessary to align Kenya's regulations with globally adjudicated trends.

The Kenyan government has gotten quite far in harmonizing its regulations with international standards, yet enforcement still lags. According to the International Energy Agency (IEA), strong legal frameworks are needed to decrease the environmental impacts associated with coal consumption globally. Nevertheless, best practices in the coal sector are implemented in a selective fashion, and there are significant enforcement gaps to address.

Kenya stands to gain significantly from the experiences of other nations that have managed to have effectual regulatory framework. Kenya's adoption of a best practice approach based on this context that balances economic development with environmental conservation can enhance the country's regulatory framework. Therefore, these regulations need to be specific particularly on emission control, proper waste management and full Environmental Impact Assessments (EIAs). However, additional health countermeasures of risks inherent to infections in the coal mining environment will significantly improve working conditions.

Therefore, reflecting on this discussion, it is clear that there is room for improvement on the existing policy frameworks that govern mining to specifically address the coal sector.

The Role of Coal in Kenya's Infrastructure Development: A Balanced Perspective

By Patrick Mutai

As the world grapples with energy shortages and infrastructure deficits, Kenya is facing numerous problems that make it to consider turning to coal as a potential solution. Currently, inadequate road networks, high construction costs, and a pressing need for reliable energy sources are shackling the country's ambitious development goals. While trying to meet these goals, Kenya is also hindered by global regulatory requirements and commitments demanding the implementation of sustainable and climate-friendly energy practices.

Annually, Kenya's finances required to support critical infrastructure projects are estimated at around \$5 billion, with \$1.5 billion needed for road construction. The big question now is: can coal offer a solution to our infrastructure development challenges? Many nations worldwide are transitioning to greener energy sources, while Kenya remains at a crossroads, weighing the economic benefits of coal against its environmental impacts. Several court cases have emerged opposing the establishment of coal utilities such as power plants, despite the identification of significant coal deposits in various parts of the country. This situation highlights the need for a careful evaluation of coal's potential contributions to infrastructure development against global climate commitments.

Kenya's ambitious development agenda necessitates robust road networks that facilitate trade and mobility. Currently, countries like China and India, which consumed over 4.520 billion tons and 1.162 billion tons of coal respectively in 2022, demonstrate the economic advantages of coal reliance. In 2023, coal demand reached an all-time high of 8.536 billion tons. While this figure is projected to fall in the near future due to sluggish global economic growth, geopolitical tensions, and shifts towards renewable energy sources, in the short term, coal will continue supporting critical areas that are energy-intensive, such as electricity generation, steelmaking, and cement production

before other non-conventional energy sources fully take over.

Through the utilization of local coal-derived products, particularly in road construction and steelmaking, Kenya can significantly reduce construction costs and improve the quality of infrastructure projects. Coal derivatives are integral to various industrial applications that directly impact road infrastructure. Coal tar serves as a primary ingredient in asphalt production, offering durability and weather resistance essential for high-quality road surfacing.

Additionally, utilizing local coal tar for asphalt production reduces dependency on imports, insulating Kenya from global price fluctuations. Similarly, coke, which is a high-carbon material derived from coal, will significantly support local steelmaking industries besides supporting the country by injecting revenue as a result of it being exported. Coke is crucial since it enhances the structural integrity of steel materials used in construction projects like the Lamu Port-South Sudan-Ethiopia Transport (LAPSSET) corridor. According to LAPSSET project report, July 2016, this could potentially create up to 200,000 jobs and boost Kenya's GDP by 1.5% annually.

In Africa, countries such as South Africa, Mozambique, and Botswana are leveraging coal as fuel, to drive their economic growth. This is done under stringent environmental controls. South Africa, for instance, generates over 80% of its electricity from coal and has developed a coal roadmap that balances economic benefits with sustainability. Kenya should learn from these models, particularly by responsibly utilizing coal to support its many infrastructure projects.

Meanwhile, Australia became one of the worlds' major coal exporter when it recently injected about \$67 billion to its economy via coal exports. These classic examples showcase how effective management of coal processing from extraction to



utilization and subsequently to global market access can shape Kenya's economy. Further, adopting these mature models underscores the importance of why Kenya should consider balancing economic gains with environmental stewardship as the country navigates its own coal resources amidst global energy transitions.

Going forward, Kenya should think along reconciling the benefits of coal with environmental responsibilities. This can be done by adopting several innovative strategies such as Carbon Sequestration, thermochemical conversions like coal-to-liquid (CTL) technology (pyrolysis and liquefaction) and gasification. Through Carbon Sequestration Technology, carbon dioxide emissions produced from coal use are captured and stored underground, preventing them from escaping to the atmosphere.

The International Energy Agency (IEA) estimates that Carbon Sequestration could reduce emissions from coal-fired power plants by up to 90%. CTL, on the other hand, offers a cleaner alternative by converting coal into liquid fuels that can be utilized in the motor industry; however, it is important to mention that utilizing these fuels might require engine structural modifications. For the case of thermochemical conversion technologies, it has been demonstrated that it is possible to sustainably bridge world energy needs alongside producing derivatives useful in chemical production such as ammonia-vital as an energy carrier and for fertilizer production.

Looking ahead, the future of coal in Kenya could be shaped by technological advancements and shifting global regulatory dynamics. With global energy trends indicating a move towards cleaner alternatives, Kenya must position itself to adapt while still leveraging its coal resources. The Environmental Management and Coordination Act, 2015 mandates public participation in environmental assessments; this should be enhanced to include coal mining activities in Kenya. This could see a blend of coal and renewables creating a diversified energy portfolio that meets both economic and environmental goals. Additionally, capitalizing on international partnerships for technology transfer and investing in clean coal technologies will be the other avenue of enhancing Kenya's capacity to utilize coal responsibly.

Collaborating with countries that have successfully implemented sustainable coal practices will provide valuable insights and resources. This will see Kenya integrate coal into its road infrastructure development strategy presenting a viable pathway to achieving enhanced economic growth. Therefore, all stakeholders-government officials, industry leaders, and citizens-should deliberate on balancing economic benefits with environmental responsibilities of coal and its derivatives during the advancement of country's sustainable development. This will be key in making coal a responsible part of Kenya's resilient and sustainable energy future.



The Role Of Emerging Technologies In Shaping The Future Of Electricity Supply And Consumption

By Dorcas Isaboke

The global energy landscape is on the brink of a transformative shift, driven by the urgent need for decarbonisation, enhanced energy security and greater efficiency. Emerging technologies in electricity generation, storage, distribution and consumption are playing a pivotal role in redefining how we power our homes, industries and transportation systems. With electricity demand expected to increase by 2050, leveraging these innovations will be critical in meeting future energy needs sustainably and affordably.

The Energy and Petroleum Regulatory Authority (EPRA) Bi-Annual Statistics report 2023/24 reveals that 83% of Kenya's electricity mix is derived from renewable sources. This achievement underscores the potential of using renewable energy technologies to sustainably meet energy supply requirements for the country. This will propel Kenya toward its 2030 goal of achieving 100% renewable energy generation.

Renewable energy technologies like solar and wind are leading the energy transition. Solar and wind capacity grew significantly in 2023. The projections suggests annual growth rates of 10% and 16%, respectively, through 2030. Kenya's renewable energy sector is underpinned by substantial contributions from geothermal (44.6%), hydropower (22.5%) and wind (14.3%). In 2023, the commissioning of the 35 MW Sossian geothermal plant and the activation of the Kenya-Ethiopia 200 MW HVDC, supplying electricity from hydropower, further solidified Kenya's renewable energy dominance. These advancements improve grid stability and cross-border energy exchange, setting a robust foundation for the nation's transition to sustainable energy.

Solar energy, though contributing 3.5% to the grid, is attracting uptake in captive generation among industries. The installed captive solar capacity of 196.2 MW reflects Kenya's industrial sector's shift toward cost-effective and green energy solutions. With favourable solar insolation and supportive policies, solar PV systems are expected to play an increasingly pivotal role.

The role of solar PV systems can be enhanced by incorporating digital technologies. Emerging digital technologies, including artificial intelligence (AI), blockchain and the Internet of Things (IoT), reshape electricity consumption patterns. Smart grids and meters enable real-time monitoring, dynamic pricing and demand response programs, empowering consumers to optimise energy use. Such systems improve efficiency of consumption, enhance grid reliability and resilience. The integration of IoT devices in homes and industries allows

energy-intensive operations to sync with off-peak hours, further balancing supply and demand.

In Kenya, the adoption of smart grid systems facilitates real-time monitoring and dynamic pricing, empowering consumers to optimise their energy use. For instance, time-of-use tariffs offer a 50% discount during off-peak hours, incentivising energy consumption during periods of low demand. These measures saved commercial and industrial consumers Ksh.947.3 million in the last six months of 2023.

Electrification, particularly in transport and industrial sectors, is another cornerstone of this transformation. Electric vehicles (EVs) are projected to account for a significant share of electricity demand by 2030. In 2023, Kenya introduced a special tariff for EVs, driving a 160% increase in energy consumption in this category. Additionally, the registration of 2,694 EVs in 2023 reflects growing adoption, spurred by reduced excise duties and VAT exemptions on EVs. The release of EVs guidelines for charging infrastructure marks a crucial step in accommodating this growth.

Policy-driven innovation and collaboration among governments, private sectors and research institutions, are crucial in scaling emerging energy technologies. Kenya's energy policies, such as the Kenya Energy Transition Investment Plan, exemplify its commitment to sustainable energy. Launched at COP28, the plan outlines strategies to phase out fossil fuel-based electricity and scale renewable capacity.

Emerging technologies are reshaping electricity supply and consumption. It offers solutions to enhance supply reliability, reduce costs and promote sustainability. Despite existing challenges, strategic investments, innovative policies and international cooperation can ensure a resilient and sustainable energy future. By accelerating adoption of these technologies signals a historic transformation, offering opportunities for economic growth, energy security and environmental stewardship. Leveraging innovation, Kenya can not only achieve its renewable energy targets but also set a benchmark for other nations. As EPRA continues to lead this transition, the nation's journey towards a green energy future remains an inspiring global narrative.



Building A Resilient Energy Sector: The Centrality Of Issuance Of Licenses, Registration Certificates And Approvals

By Daniel Kiptoo Bargoria, MBS, OGW

Access to sustainable and affordable energy is an important element in achievement of Kenya's Bottom Up Transformative Agenda. Luckily, Kenya is a signatory to the sustainable development goals (SDG), and the SDG number seven guides the country in ensuring access to clean and affordable energy. How do we achieve this though, as a country? The concept of energy transition, which dwells on shift from the conventional fossil fuels to renewable energy on one hand, and shift from inefficient to efficient use of energy on the other hand, has been fully embraced. Energy transition will help in attainment of BETA goals and this transition must be just. This implies that it must focus on safety, affordability, energy security and sustainability. This is where the Energy and Petroleum Regulatory Authority comes in, through issuance of licenses, approvals and registration certificates for appliances. Utility companies, individuals and contractors are issued with these instruments, to meet the one or more of the mentioned conditions. Let us see why and how.

Energy affordability is at the heart of

every consumer and the Authority strives, through tariff approvals, to ensure that there is fairness of price transaction between the utility and the consumer. In the approval of tariffs, the Authority considers the revenue requirements of the utility and the reasonable returns of the utility investors. Revenue requirements include the money to pay utility employees, purchase power from generators and invest in projects that strengthen the grid. This is an important part of regulation, which helps prevent price exploitation of the consumer, while at the same time ensuring that the utility is financially healthy to continue offering services. A utility that makes losses, due to low tariffs, would shut down, sending the country into an energy crisis. A market where consumers that cannot afford to purchase energy, due to high prices, would also shut down, leading to market failure. It is therefore necessary for the Authority to come in and ensure balance, in what is called Pareto Optimality. Affordability is not enough though. A licensed utility must offer safe, reliable and quality service.

Generation, transmission and distribution licenses issued to utilities have conditions for safety. The Authority draws these conditions from Kenya and

international standards. A good case in point: during power line construction, the utility should maintain a minimum clearance of the line from the ground. Imagine a situation where an overhead power line touches your head as you cross the road. This would lead to death. It is therefore necessary to have licensing conditions that ensure the utility builds the line in such a way that it does not endanger lives. The same applies to voltage, frequency and harmonics of the power system. It might be essential to know that the same conditions apply to oil pipeline construction and operations. Safe energy services are good, but they must also be reliable.

Reliability requires that consumers get the services in the quality and quantity expected. Here, the idea of blackouts come to mind. The Authority issues and monitors reliability targets to licensed utilities. They ensure that reliability is kept at the best possible level. This is through indices like SAIFI, SAIDI and CAIDI, otherwise also known as System Average Interruption Frequency Index, System Average Interruption Duration Index and Customer Average Interruption Duration Index. These are reported in the Authority's annual statistics report. The question is, does

the monitoring help? It definitely does, and the utility has improved, thanks to the intervention of the Authority. The aim is to keep power supply flowing, at all times, in right quality. It should however be noted that licensing and monitoring the utilities is not enough. Technicians and contractors play a vital role in safety and reliability of energy supplied.

Contractors install power systems at the consumer end. A well organized utility, with premium services, cannot function well if the installations at the demand side are problematic. The Authority comes here too, to license firms and individuals who do engineering works for consumers. Emphasis is laid on the workability –power must flow- and the safety of the system. The licensee in this category must carry out all the necessary tests, which-well for engineering audience- continuity test, earth loop test, earth resistance test and insulation test. Without these, the consumer would be at risk of electrocution. The Authority conducts technical and surveillance audits to ensure that the electricians and contractors work according to standards. Does this ensure sustainability though? No. One must bring in energy transition, to complete the cycle.

The Authority issues licenses for practitioners in solar PV systems and energy auditing, and certificates for energy efficient appliances. The licenses for solar PV systems are a mimicry of those for electricians. The difference is that the licensees design and install solar PV systems, alongside the wiring and testing process. Energy efficiency, on the other hand, is associated with bringing down the cost of energy. The appliance registration certificate ensures that only energy efficient appliances are imported into the country. Energy auditing licensees help designated facilities –these are selected energy consumption entities- in reducing their energy use, without compromising the quality and quantity output. All the licensees, it should be noted, must meet certain qualification thresholds.

The Authority has set out conditions, through regulatory tools, for obtaining licensees. These conditions vary, depending on the nature of the license. For example, utilities must prove to have both financial, legal and technical capabilities to undertake the project whose license they apply for. Contractors should have the requisite tools and personnel to obtain the licenses. Individuals undergo competency tests for license issuance. The processes are transparent, efficient and nondiscriminatory.

With all these therefore, the Authority ensures that the citizen is served by utilities, contractors, electricians and technicians who adhere to the concepts of accessibility, affordability and sustainability in the energy sector. The citizen, although not licensed, plays a critical role by ensuring that they only engage licensed individuals while doing their work. All these are important even as we try to meet the BETA agenda goals and the SDG number seven.

The writer is the Director General at EPRA.

Notes: This article was first published on Capital FM online platform.



Universal Access: The Need For Schools To Expand Our Wealth Of Knowledge



By Dr. (Eng.) Fenwicks Musonye

In Kenya, there is a beautiful but incomplete blockbuster story. The story about universal access to electricity. Over the past 10 years, the country, through various programs, has increased access to electricity from 32 % in 2013, to 84 % in 2024. However, the access growth rate has plateaued, justifiably so: the universal access campaigns have dealt with all the easy to connect areas, and the remaining regions require more than the ordinarily applied strategies. The teams working on this have to come up with ingenious ways to ensure the 16 % are also covered. This calls for a number of interventions that require deployment of technological, financial and human resources. Here, let us look at human resources. How can our education system contribute towards meeting the connectivity efforts?

The Kenyan tertiary education has a big role to play in ensuring universal access to affordable, sustainable and reliable electricity. By offering courses tailored towards meeting the connectivity contemporary challenges, the institutions of higher learning will empower the human resource in the power sector to ensure all the citizens of the country have access to electricity. The nature of these current challenges goes beyond the technological, financial and legal considerations. One has to look at anthropological factors, to complete the equation.

Tertiary level institutions should train the modern day energy market expert to deal with problems of energy project management, productive use of energy, energy justice, stakeholder management, results based financing, digitization and decentralization. Whereas some of these terms have been overused, to the degree that they risk being consigned to buzzwords, they potent practical limitations to the campaigns to achieve the target of universal access of electricity. So, what should our colleges and universities do?

The schools should integrate these disciplines in their energy based curricula, to encompass both the soft and the hard skills. For example, all engineering and energy related courses should incorporate project management as a course unit. This will help learners understand the general concepts of initiating, planning, implementing and closing projects, which will be useful for universal access. Within these project management

process areas, the prospective professionals will learn how to integrate the human related factors of connectivity with quality, safety and affordability of the projects. The knowledge delivery is not enough. What matters is how the knowledge is delivered.

Universities and colleges should place emphasis on challenge driven education (CDE). This method, which would go a long way in improving our human capacity in universal access projects, focuses on challenge based acquisition of knowledge. The pedagogic-or andragogic if you like- approach should therefore focus on existing connectivity problems, from which learners can craft project management related problems and design solutions. One common tool used to help learners is the Practicum Design. Institutions should find a working relationship with the government and energy related industries, in a triple helix arrangement, to ensure that their learners benefit from problem based learning. The CDE approach can be useful in helping learners understand tactical ways of dealing with universal access problems. There is need to improve on the strategic interventions too.

Learners should be given opportunities to have hands-on training in policy modeling. Do we have learning institutions in Kenya committed to this discipline? Better find a needle in a haystack. Time is nigh for our institutions to introduce these courses, to help upskill the experts dealing with connectivity projects, or those who will join later. There is need to invest in training experts and modeling laboratories that will help the Kenyan energy market expert to learn how to plan and optimize power supply to the harder to reach areas.

As institutions revise their energy and engineering curriculum- which they often do- there is need to expand the net of consultation, a comprehensive one for that matter, to include stakeholders who implement energy projects. This will nudge the universities out of their ivory towers, and the government and industry from their high horses-as the three always accuse one another of these crimes-to collectively improve universal access. Come on, this can be done!

The writer is Deputy Director, Energy Efficiency at EPRA & a lecturer of Energy Engineering.

Regional Power Interconnectors Will Unlock Eastern Africa's Energy Potential



By: Dr. Eng. John Mativo, MBS

The vision of a unified and electrified Eastern Africa is no longer a distant dream, but an attainable reality made possible by regional power interconnectors. Significant electricity projects are driving increased power exchange and fostering broader regional energy and economic collaboration.

Though the region has long been considered as rich in untapped energy resources, unreliable electricity supply, energy deficits and isolated markets, regional power interconnectors are now emerging as key to unlocking the region's vast energy potential.

Kenya Electricity Transmission Company (KETRACO) has just completed and energized the 400kV Kenya-Tanzania Interconnector- a 510km transmission line from Isinya, Kenya, to Singida, Tanzania. This new infrastructure is set to strengthen energy ties between the two nations, paving the way for increased power exchange and supporting broader regional energy and economic integration.

This project will additionally facilitate power exchange between Ethiopia, Kenya, Tanzania, the Southern Africa Power Pool, Sudan and Egypt in the north as well as enhance access to cheap electricity through the Eastern Africa Power Pool (EAPP) by economic merit order dispatch.

Regional power interconnectors are not merely tools for power transmission; they serve as catalysts for economic growth, environmental sustainability, and regional integration. The 13-member states of the EAPP utilize interconnected grids to enhance energy security, harness the full potential of renewable

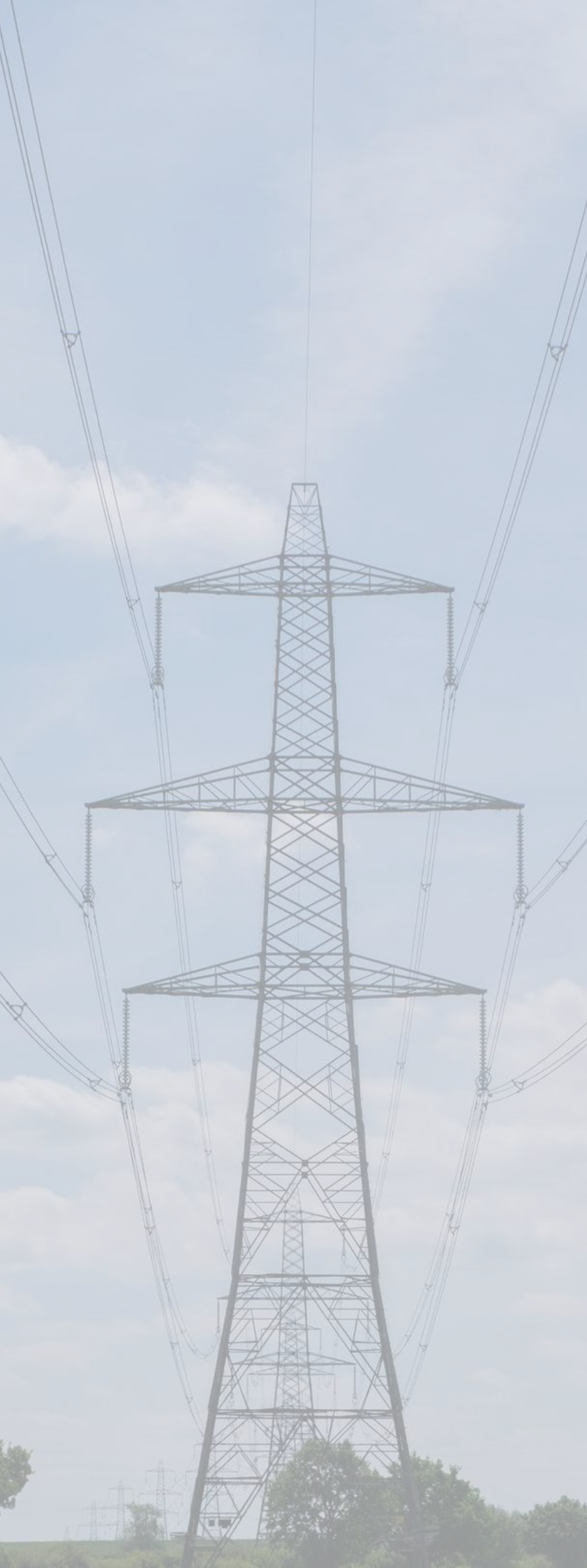
energy and promote shared economic benefits among member countries.

By pooling energy resources through regional interconnectors, member states gain access to lower-cost electricity and collectively invest in renewable energy while reducing dependence on expensive and environmentally harmful fossil fuels. Kenya's geothermal and wind power, for instance, complement Tanzania's hydroelectric potential. This synergy not only stabilizes power supply but also paves the way for achieving Kenya's Vision 2030 goal of 100 per cent renewable energy reliance.

The need for regional power interconnectors is now more urgent than ever. Furthermore, the interconnected system allows for more efficient energy storage and transmission. When one country's renewable generation peaks, surplus energy can be exported to another nation, reducing waste and ensuring that green energy is utilized as efficiently as possible.

For instance, Kenya has largely harnessed Ethiopia's massive hydroelectric power. The electricity imports from Ethiopia rose 88 percent in the first six months (H1) of 2024 as compared to a similar period in 2023.

Kenya imported 672.26 million kilowatt-hours (kWh) of power from Ethiopia during the six months, an increase from 357.44 million kWh a year ago. The imports have been on the rise, growing from a low of 20 million kWh a month in 2023 to a high of 122 million kWh per month in 2024. Kenya is expected to save a minimum of \$10 million in a single year due to electricity supplies from Ethiopia.



One of the most profound benefits of regional power interconnectors is the potential for greater energy access. In Eastern Africa, millions of people still live without reliable electricity, limiting their opportunities for education, healthcare, and economic development. The interconnection of power grids can provide an affordable and sustainable solution to these energy access challenges. For example, The Power Purchase Agreement (PPA) between Ethiopian Electric Power (EEP) and Tanzania Electricity Supply Company Limited (TANESCO) outlines a power trade between Ethiopia and Tanzania, transmitted through Kenya's transmission network. TANESCO plans to purchase 100MW from EEP, with the amount set to increase to 200MW over the next three years. This will greatly improve energy access in Tanzania.

Regional interconnectors allow countries to sell electricity to one another at competitive prices. This can lower the cost of power for consumers in underserved regions and foster industrialization and job creation. Additionally, a more stable and reliable energy supply is a prerequisite for attracting investment in key sectors such as manufacturing, agriculture, and services.

The path to a fully integrated Eastern African power grid is not without its challenges. Political and regulatory barriers, financing issues, and infrastructure constraints need to be addressed to ensure the success of these interconnectors. However, the potential rewards are too significant to ignore.

KETRACO remains committed to supporting the EAPP vision of transforming the Eastern part of Africa to a region recognized as one of the best investment destinations in the world by energy intensive users.

The writer is the Managing Director, Kenya Electricity Transmission Company Ltd (KETRACO).

Information Communication Technology: The Greatest Enabler

By Allan Gathuru Wairimu

Over the years, we have learnt to appreciate the role played by Technology in different spheres of our lives. Specifically, the Information Communication Technology (ICT) has transformed how things are done. Without it, work would be hard and cumbersome. The impacts of this technological revolution are being felt in Kenya and other parts of the world. Just as the Agrarian and the Industrial Revolutions had profound effects on civilization, the ICT revolution will transform how things are done in ways we may not fathom.

The ICT revolution will play a critical role in improving access to electricity. It will impact the supply and demand side of electricity value chain.

ICT has transformed power market activities by optimizing the planning, generation, transmission, distribution, dispatch control and consumption value chains. This optimization has been possible due to the ICT enabled automation, which has been achieved through use of robotics and artificial intelligence (AI).

Automation has increased production rates and improved quality service levels. Tools such as LEAP, Times® and Plexos aid in energy planning. Virtual reality technologies continue to improve designs, through simulations, enabling construction of optimized power plant, transmission and distribution networks. Automated algorithms in SCADA and other systems are executing tasks with high precision than human beings. Connectivity between components used in power generation, be it in geothermal, thermal, hydro and wind power or other plants has improved through upgrades in network communication with the advent of 4G and 5G networks.

In transmission and distribution, ICT is used to establish reliable control functionalities for secure operation of large, interconnected grid systems thereby improving supply reliability. Renewable energy sources integration into the grid and their optimization is made possible by use of technologies that balances the supply and demand. The information flow between the electricity producing utilities, consumers and the control centre is made possible through ICT.

With increased communication, the challenge of cybersecurity of all interfaces is inevitable. If there were to be an unauthorised access to the grid, it would be a national disaster. ICT mitigate this by providing impenetrable security protecting the grid. The security triage of confidentiality, integrity, and availability comes into play with availability of the power grid being the most crucial parameter.

Technology also enables real-time monitoring and predictive maintenance leading to increased efficiency and reduced downtime.

At the consumer side, ICT plays a pivotal role to improve service delivery and customer experience, right from internet of things, smart meters offering real-time monitoring, automatic power consumption readings and remote access. The “tokens” have revolutionized power consumption in Kenya. The E-commerce platforms rolled out have allowed power utilities to reach the lengths of our Republic while leveraging on cashless payments like mobile money to improve the ease of power purchase.

In tariff setting, advanced technologies like AI can be used to analyse vast amounts of data, where machine learning (ML) is used to identify market trends, to guide on setting of evidence based tariffs.

At the household level, smart homes are gaining traction where cooling, ventilation, heating and other power consuming appliances can be controlled through ICT systems. The design of these appliances has also evolved with technology to improve their security, enhance energy efficiency and reduce their physical size.

At the utilities level, technology growth around data centres has guaranteed access to computing resources. The deployment of enterprise resource planning systems has increased efficiency of companies to plan, track budgets and operations. Data portals have enabled data sharing to track sector key performance indicators. This incorporates data repositories, visualizations, algorithms and models, which are driven by ICT.

With improvement in technology, citizen generated data from crowdsourcing initiatives like self-meter reading using mobile computing is gaining momentum. Cloud computing and related data privacy issues are also fully in the limelight controlling discussions with most technology companies preferring to provide subscription cloud solutions. Block chain technology is being leveraged to ensure confidentiality and transparency in transactions.

Looking into the future, technologies will keep improving and the state of the union between power and ICT will keep getting stronger. Valuable and customer centric technologies should be deployed strategically along the energy value chain to enhance efficiency and reduce tariffs.

The writer is the Manager, ICT (Data & Systems) at EPRA

Powering Kenya's Green Future: The Role Of Hydro Generation



By Marcy Chelagat

As Kenya continues to push for sustainable energy solutions, hydroelectric power remains a key part of the country's energy strategy. Contributing around 25% of the nation's installed electricity capacity, hydro generation plays a vital role in meeting growing energy demands while minimizing environmental impact. However, challenges such as climate change and aging infrastructure call for a re-evaluation of how hydro generation is managed and modernized for long-term sustainability.

Kenya's geographical landscape, rich with rivers, provides an ideal setting for hydroelectricity. Large-scale hydropower plants like the Seven Forks scheme have supplied affordable and reliable energy to millions of Kenyans for decades. Hydropower is renewable and produces minimal greenhouse gas emissions, making it a key pillar in Kenya's fight against climate change.

The Energy and Petroleum Regulatory Authority (EPRA) oversees the regulation and development of Kenya's hydropower plants. One of EPRA's key roles is ensuring that new and existing plants comply with quality and safety standards. For example, EPRA provides technical expertise to the National Environment Management Authority (NEMA) during processing of the environmental and social impact assessment reports for hydro projects proposals. Furthermore, EPRA monitors the operation parameters of the hydro power plants to ensure reliability and security of energy supply for the country.

EPRA with other agencies, through the Feed-in-Tariff Policy encourages the development of smaller, decentralized hydro projects. This policy offers these projects preferential rates of selling energy to the national grid. The arrangement guarantees investors a ready market for uptake of energy generated from the

hydros. By investing in both large and small-scale hydropower, Kenya can maximize its water resources and enhance energy security. The country can use the emergence of new technologies to improve exploitation of this energy source.

Digital monitoring systems enable real-time adjustments to energy production, helping operators better manage fluctuating water levels caused by changing weather conditions.

Pumped storage hydropower is another promising development. Acting as a large-scale energy storage solution. These systems store excess energy by pumping water to higher elevations and releasing it for electricity generation during peak demand. This helps balance the grid and integrate other renewables like wind and solar, enhancing grid stability.

Hydropower will continue to play an essential role in Kenya's energy strategy, but diversification is critical. By combining hydro with other renewable sources such as geothermal, wind and solar, Kenya can reduce its vulnerability to climate change while ensuring a steady supply of electricity.

Besides its environmental benefits, hydro generation is economically advantageous. Once operational, hydro plants have relatively low running costs, leading to affordable electricity. This not only helps households but also fuels industrial growth, making hydroelectricity a backbone of Kenya's economy.

While hydroelectricity is crucial for Kenya's energy sector, it is heavily reliant on rainfall. In recent years, erratic weather patterns and prolonged droughts have lowered water levels in key reservoirs, reducing electricity output. This over-dependence on hydropower during dry seasons has prompted a shift towards diversifying Kenya's energy sources.

In addition to climate-related challenges, hydropower projects can disrupt ecosystems and local communities. Damming rivers for electricity generation often requires large-scale alterations to natural water flows, which can affect agriculture downstream and displace populations. Ensuring the social and environmental sustainability of these projects remains a challenge.

Regional cooperation on hydropower projects offers another avenue for growth. Kenya, along with neighbouring countries, can tap into cross-border hydropower schemes that increase electricity generation while fostering economic collaboration in East Africa.

Hydroelectric power remains a crucial element in Kenya's journey toward a sustainable and resilient energy future. While challenges such as climate change and environmental impacts must be managed, hydropower's economic and environmental benefits make it one of cornerstones of the country's energy resource. With EPRA's continued oversight, modernization efforts and technological innovations, hydro generation can continue to thrive as part of a diversified energy portfolio, powering Kenya's growth for generations to come.

Expanding Renewable Energy Sources To Tidal And Wave Energy Technology Can Expand Energy Access

By James Mark Omondi

Today's electricity power sector faces challenges of demand surges and effects of climate change. The combination of increasing demand and insufficient supply raises concerns on energy security. This challenge can be solved by adopting renewable energy sources.

Adoption of renewable energy has emerged as a promising technological solution in modern energy mix. This technology has a challenge of intermittency, which affects grid stability. This challenge can be minimized by adoption of variable types of renewable energy resources like solar, wind, tidal and wave energy.

Tidal and wave energy are two forms of ocean energy that harness the power of water to generate electricity. Wave energy is a form of the kinetic energy produced by wind-driven movement of ocean water surface. On the other hand, tidal energy is a form energy from rise and fall of water caused by gravitational interaction between the earth, sun and the moon.

A number of methods have been created to efficiently harness this energy. For example: point absorbers, which are buoyant devices that float on the surface and generate electricity from the vertical motion of waves; Oscillating water columns (OWC) pressurize air and power turbines by using the water's rise and fall inside a chamber; long multi-segmented floating structures called attenuators run parallel to the direction of waves and produce power using hydraulic pumps that are triggered by the relative velocity of their segments; overtopping devices use incoming waves to collect water in a reservoir, which is subsequently discharged to power turbines.

In locations with high tidal currents, tidal stream generators—which resemble wind turbines—are positioned underwater to produce power as the water flows through them. Built across estuaries, tidal barrages resemble dams. They collect water at high tide, releasing it through turbines at low tide. Dynamic

tidal power, while still under research, suggests capturing kinetic energy from tidal currents achieved by constructing lengthy dams from the coast into the sea. Similar to tidal barrages but constructed as enclosed spaces, tidal lagoons use turbines to absorb and release tidal waters in order to generate electricity.

The advantages of tidal and wave energy are substantial. As long as the earth is subject to the gravitational pull of the sun and moon, they can provide sustainable energy. A dependable energy source can be ensured by the high predictability of tidal energy. If exploited, these technologies complement other renewable energy sources like solar and wind, offering a more reliable energy supply.

However, challenges still exist in the development and implementation of wave and tidal technologies. Some of these challenges include high upfront costs, which necessitate a large financial commitment. Careful site selection and comprehensive environmental impact evaluations are required due to environmental concerns, including the possible effects on wildlife and marine ecosystems.

Furthermore, the severe sea environment presents technological difficulties for energy harvesting systems' longevity and upkeep, such as corrosion in saltwater, biofouling, and severe weather. These technologies depend on particular wave and tidal patterns to function, not all coastal regions are appropriate for them.

As we continue to explore and refine ways to harness ocean power, wave and tidal energy are poised to play a crucial role in transitioning to more sustainable and resilient energy future. Ongoing technological advancements and a growing emphasis on clean energy solutions are driving the development of these innovative systems, which despite these challenges have enormous potential to contribute significantly to the global renewable energy mix.

The writer is a Renewable Energy Officer at EPRA

Balancing Energy Access While Affirming Environmental Stewardship

By Carol Wanza and Cynthia Omenge

Strict regulations imposed in the energy sector have ensured public and private sector-driven investments adhere to laid down environmental guidelines. While investor incentives have continued to attract billions of shillings in different projects, they have ensured minimal environmental negative impact during construction and have maintained 'clean' energy norms during their operations.

The Energy Statistics Report 2024 reveals that Kenya is on course to achieving 100 percent electricity generation from renewable sources by 2030. Currently, 83 per cent of the energy supplied to Kenya's national grid is from renewable sources.

Kenya has also been applying Waste Heat Recovery Cycle technology to generate electricity at a capacity of 83.5MW (2.33%). While still new in the energy market, Waste heat recovery technology utilises heat, from the excess exhaust gases to produce steam, which rotates electric generators-via steam turbines-to produce electricity.

The energy sector is also experiencing a clean cooking revolution with bio-ethanol uptake shooting 56.4 percent or 13,565,289 litres more to stand at 37,622,368 litres of bio-ethanol used to meet cooking and lighting needs.

The biofuels guidelines released in 2022, have unlocked biofuels businesses as they are designed to promote the safe use of biofuels and encourage adherence to relevant standards across the value chain, from production, transportation, storage, packaging, and sale of bioethanol.

The Energy and Petroleum Regulatory Authority (EPRA) is working on a regulatory framework to ensure safety in Autogas operations. Currently, most autogas stations are located within Nairobi, hence the need to expand provision of autogas across major towns to promote uptake of the same.

This started with last year's introduction of an e-mobility tariff that is soon to be made sweeter with removal of the daily 15,000 kWh limit to allow long distance electric buses and trucks to benefit from the tariff.

EPRA and other regulatory agencies have implemented government policies that support electric vehicles with importers enjoying zero rated import duty on completely knocked down units while importers of electric vehicles pay a 10 percent import duty down from the 25 percent paid by internal combustion engine vehicle importers.

Three thermal plants have since been decommissioned after their power purchase agreements lapsed with more set for decommissioning when their power purchase agreements ends. The drive to end Kenya's costliest energy sources is also credited with reducing carbon emissions from the thermal plants that rely on heavy fuels to generate electricity.

LPG, an alternative clean source of cooking fuel has also experienced a sharp rise after taxes were zero rated leading to lower consumer prices. With EPRA reporting a 1288% rise in the past decade from 92,900 kilograms consumed annually to the current 360,594.

EPRA ran the 'Tusonge na EVs Campaign' to promote uptake of electric two and three wheelers by the public service vehicle sector.

It is imperative that energy access is improved especially in the Remote and Rural Areas in the country. We can well achieve this and still strike a balance on climate resilience, realising an environment friendly approach would be key to achieving this, a move that could secure the future while improving the energy state in the country, as we aim to effect the recently concluded COP29's theme of 'Investing in a Liveable Planet for All'.



Public Baraza On Energy And Petroleum Safety

EPRA's Public Education & Advocacy team conducted a baraza on energy and petroleum safety at the Embakasi social hall in Nairobi in August 2024.



EPRA's Upstream Petroleum Officer, Daniel Gitau makes a presentation on petroleum & gas matters.



EPRA's Electricity Officer, Sospeter Lotuko speaks about electricity safety, regulatory compliance, and applicable standards in the electricity sector.



EPRA's Senior Office Administrator, Christine Mwangi speaks on complaints handling mechanisms.

Energy Conference

EPRA Corporation Secretary & Director of Legal Services, CS. Ibrahim Kitoo, in November 2024 delivered a keynote address at the Energy Conference at the University of Nairobi, Parklands Campus. The conference themed 'Fuelling Africa: A Student-Led Initiative on Energy Transition and Just Energy Practices' underscored the importance of youth engagement in shaping the future of energy and petroleum sectors in the country.



EPRA's Corporation Secretary & Director of Legal Services, CS. Ibrahim Kitoo speaks at the Energy Conference.

Courtesy call to the County Government of West Pokot

EPRA's Deputy Director of Public Education & Advocacy Anne Kiprotich, accompanied by the Manager, Public Education & Advocacy, Bessie Atieno and Surveillance & Enforcement Officer, Jackson Chacha paid a courtesy call to the County Secretary County Government of West Pokot Hon. Jonathan Siwanyang in September 2024.



County Secretary, County Government of West Pokot Hon. Jonathan Siwanyang (in a suit) pose for a photo at his office with EPRA's Deputy Director of Public Education & Advocacy Anne Kiprotich (2nd from right), Public Education & Advocacy, Bessie Atieno (r) and Surveillance & Enforcement Officer, Jackson Chacha (l).

Tree Planting

EPRA's Director of Corporate Services, Marona Cheplel, joined the Cabinet Secretary, Ministry of Energy, Kenya, Hon. Opiyo Wandayi for a tree planting exercise in Narasha Forest, Baringo County in September 2024. This initiative underscores EPRA's commitment to environmental sustainability and the importance of preserving our natural resources.



EPRA's Director of Corporate Services, Marona Cheplel plants a tree. He is being assisted by the Cabinet Secretary, Ministry of Energy, Kenya, Hon. Opiyo Wandayi.



EPRA's Director of Corporate Services, Marona Cheplel plants a tree. He is being assisted by the Cabinet Secretary, Ministry of Energy, Kenya, Hon. Opiyo Wandayi.

Energy Benchmarks

In September 2024, EPRA hosted the Energy Performance Benchmarking Workshop for Sugar and Tea Manufacturing Facilities in Kakamega and Kericho Counties respectively.



EPRA's Director of Corporate Services, Marona Cheplel speaks during the Energy Performance Benchmarking Workshop for Sugar Manufacturing Facilities in Kakamega County.



EPRA's Senior Energy Efficiency Officer, Eustace Mureithi Njeru makes a presentation during the Energy Performance Benchmarking Workshop for Tea Manufacturing Facilities in Kericho County.

Lake Region Motor Show 2024

EPRA participated at the Lake Region Motor Show 2024 held at Goan Centre, Kisumu in November 2024. The forum is focused on promoting the uptake of e-mobility in rural areas. EPRA's Ag. Manager, Environment, Health, and Safety, Mr. Silas Sanga accompanied by Senior Research & Policy Analyst, Mr. Lee Okombe and Corporate Communications Officer, Arnold Musalia attended the show.



EPRA's Ag. Manager, Environment, Health, and Safety, Silas Sanga (in a blue suit) follow proceedings during the Lake Region Motor Show 2024.



Senior Research & Policy Analyst, Lee Okombe (r) and Corporate Communications Officer, Arnold Musalia (l) follow proceedings during the Lake Region Motor Show 2024.

Mediation conference

In October 2024, EPRA sponsored and participated at the 3rd mediation conference convened by Chartered Institute of Arbitrators, Kenya Branch (CI Arb) under the theme “Mediation in a changing world: Strategies, Technologies and Global Perspectives” at the Hyatt Regency, Westlands - Nairobi.

EPRA's Deputy Directors of Legal Services and Commercial Services, Mr. Robert Mahenia & Ms. Leah Jara respectively attended the conference.



EPRA's Deputy Director of Legal Services, Robert Mahenia speaks during the 3rd mediation conference convened by Chartered Institute of Arbitrators, Kenya Branch (CI Arb).



EPRA's Deputy Director, Commercial Services, Ms. Leah Jara (l) speaks during the 3rd mediation conference convened by Chartered Institute of Arbitrators, Kenya Branch (CI Arb).

EIK International Conference & Exhibition

EPRA Director General, Mr. Daniel Kiptoo Bargoria in October 2024 delivered a keynote address at the 3rd Environment Institute of Kenya (EIK) International Conference & Exhibition in Mombasa.



EPRA Director General, Daniel Kiptoo Bargoria delivers a keynote address at the 3rd EIK International Conference & Exhibition in Mombasa.



EPRA Director General, Daniel Kiptoo Bargoria delivers a keynote address at the 3rd EIK International Conference & Exhibition in Mombasa.

State of Energy & Petroleum Sectors Financial Year 2023/2024 Statistics Report Briefing

In October 2024, EPRA released the Energy & Petroleum Sectors Statistics Report 2024 in Nairobi. EPRA board of Directors, Director General, staff, the media and invited stakeholders attended the briefing.



EPRA board chairperson, Hon. Justice (Prof) Jackson Ojwang follow proceedings.



EPRA Board of Directors: Jennipher Nawoi Long'or and Gabriel Kaunda Kitumu follow proceedings.



EPRA Director General, Daniel Kiptoo Bargar speaks during the State of Energy & Petroleum Sectors Financial Year 2023/2024 Statistics Report Briefing

Customer Service Week 2024

In October 2024, EPRA Director for Economic Regulation & Strategy, Dr. John Mutua joined staff in a cake cutting session in observation of the customer service week in line with the theme 'Above and Beyond'.



EPRA Director for Economic Regulation & Strategy, Dr. John Mutua being assisted by Office Administrator, Purity Mutuku (r), Senior Customer Care Assistant, Chispine Shilwatso (2nd from left) & Irene Khatali (l) during a cake-cutting session.

Validation Workshop

In August 2024, EPRA conducted a Stakeholder Validation Workshop on the 2nd Cost of Service Study in the Supply of Petroleum Products (COSSOP) in Kenya in Nairobi. The purpose of the study was to update the underlying assumptions, analyse the parameters that define the pricing value chain, and then recommend an updated price determination mechanism for regulated petroleum products.



EPRA Director General, Daniel Kiptoo Bargar, OGW speaking during the COSSOP workshop.



EPRA Manager, Corporate Communications, Immaculate Mwendu speaking during the COSSOP workshop.



EPRA Director for Economic Regulation & Strategy, Dr. John Mutua takes notes during the COSSOP workshop.

Board Tour to Seven Forks Hydro Power Stations

The Board of Directors led by the Chairperson Hon. Justice (Rtd) Prof. Jackton Ojwang in December 2024 toured the Seven Forks Hydro Power Stations. The visit was aimed at enhancing the Board's understanding of the operations and management of one of Kenya's key hydroelectric power generation sites.



EPRA Board Chairperson Hon. Justice (Rtd) Prof. Jackton Ojwang plants a ceremonial tree in commemoration of EPRA Board to the seven forks dams at KenGen Offices.



EPRA Board of Directors led by the Chairperson, Hon. Justice (Rtd) Prof. Jackson Ojwang (l) receives a safety brief outside KenGen Hydro Plaza Offices.



EPRA Board of Directors, EPRA & KenGen staff pose for a group photo during a tour of the Masinga Hydro Power Station.



EPRA Board of Directors Chairperson, Hon. Justice (Rtd) Prof. Jackton Ojwang (c) signs a visitors book upon arrival at the Masinga Hydro Power Station.

ENERGYSCOOP



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