

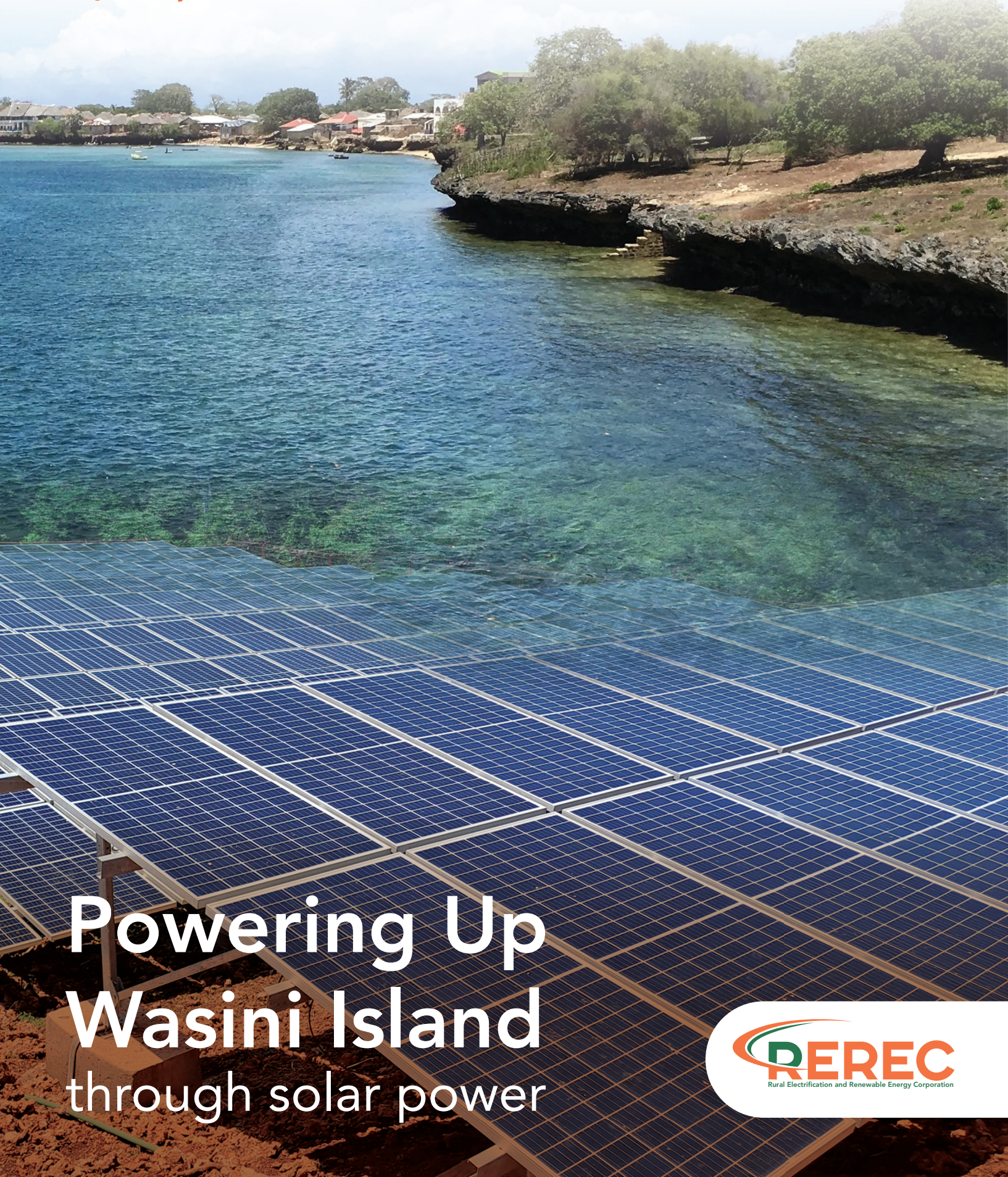


Oct - Dec 2023

# The Highlight

Quarterly Newsletter

Issue No. 14



Powering Up  
Wasini Island  
through solar power





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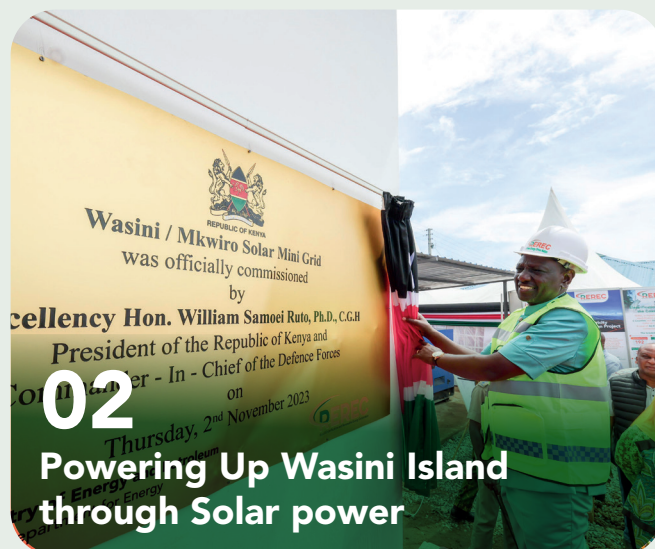
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# Editor's Note

## Greetings Highlighters,

We are thrilled to present the final edition this year, an edition bursting with freshness. This season, we were all about building a sustainable future for generations to come through innovations, action and giving back to the community.

Fasten your seatbelts as we take flight into a future fueled by innovation and green dreams! Our feature on sustainable aviation fuel will have you dreaming of a world where planes soar high without leaving a carbon footprint.

As we celebrate milestones achieved, we were honored to have the President of the Republic of Kenya, H.E. William Samoei Ruto officially commission one of our projects, the Wasini/Mkwiro Solar mini grid which connected about 600 households to electricity for the first time. We also join the league of extraordinary eco-warriors fighting climate change with bold ideas and even bolder actions. From grassroots greenery to national green initiatives, we let you in to our tree planting initiatives; as a show of our commitment to our mandate and collective action.

As the curtain falls on this year, we also celebrate the launch of REREC's strategic plan 2023-2027 which aims to connect 1 million customers in rural areas through electrification of 15,000 public facilities and installation of 5,000 transformers. Let's celebrate the triumphs, big and small, that have defined our journey.

As the year came to an end, it was time for CPA Peter Mbugua to proceed on retirement and hand over the baton to the newly appointed CEO, Dr. Rose Mkalama, our first ever female CEO. We are excited to see her lead REREC towards accomplishing 100% rural electrification and achieving greater milestones.



Beatrice Njuguna

*Editor-In-Chief*

But wait, the show isn't over! The Corporation's Board of Directors took the front row in leading a CSR activity in Nguu Tatu, a village tucked in Kisauni constituency Mombasa County. Spoiler alert: It's not just about the bottom line giving; it's about making the world a better place and securing the future for the young lives at AL Mansoor Children's Home.

From all of us at the Highlight, we wish you and your loved ones a joyful, healthy, and prosperous New Year! Together, we will make 2024 a year of milestones and achievements.

Thank you for being part of our community.

We value and appreciate your feedback. Engage us through [info@rerec.co.ke](mailto:info@rerec.co.ke)



RERECKenya



REREC\_Kenya



RERECMashinani



RERECMashinani





## Powering Up Wasini Island through Solar power

His Excellency President William Ruto officially commissioned the Wasini Island Solar Power Mini-Grid, a project implemented by the Rural Electrification and Renewable Energy Corporation (REREC). The installation marks the first time that the Island villages of Wasini and Mkwiro located in Lungalunga Constituency, Kwale County have been connected to electricity, symbolizing a significant turning point in the lives of the island's residents.

“The solar power mini grid is set to change the lives of the Island's residents by providing them with access to reliable and sustainable electricity.”



The commissioning ceremony held amidst a backdrop of excitement and anticipation, is a significant leap forward for the communities residing on the Island renowned for its pristine beauty and tranquil surroundings. The Island is inhabited by a population of approximately 4,000 people and has been isolated from modern amenities with the absence of electricity posing significant challenges to its inhabitants. The commissioning of the solar power mini-grid is therefore set to change the lives of the Island's residents by providing them with access to reliable and sustainable electricity.

The electrification project is expected to expand the rapidly growing villages, enhance security and spur social economic activities in the area by connecting schools, health facilities, religious institutions, administrative centers and households to electricity.

In his address, the president emphasized the importance of electrification in rural areas, highlighting the Government's commitment to improving the livelihoods of all Kenyan citizens. "I would like to thank the friends of Kenya who have collaborated with us to implement this project for the benefit of the people of Wasini. Today, the project that has cost us 350 million shillings will be able to electrify 600 households. We want every house here to get electricity and we will ensure that even your schools and fish landing sites are electrified" he said.



*REREC's CEO Dr. Rose Mkalama accompanied by REREC's Board Chairman Mr. Godfrey Lemiso and Board Director Mr. Hussein Mohamed receiving H.E. Dr. William Ruto, President of the Republic of Kenya, at the Wasini/Mkwiro solar mini grid commissioning*



*REREC Board Chairman Mr. Godfrey Lemiso welcoming the President, H.E. Dr. William Ruto at the Wasini/Mkwiro Solar mini grid. Looking on are other REREC Board of Directors and Government dignitaries.*



*Eng. Fred Ishugah, General Manager, Renewable Rnergy Research & Development, taking the President H.E. Dr. William Ruto & Deputy President Rigathi Gachagua through the Wasini/Mkwiro solar mini grid project information.*



The Wasini/Mkwiro Solar Power mini-grid will serve as an inspiring example for other underserved communities, highlighting the transformative potential of renewable energy. The Plant has a capacity of 737 Kilowatts per hour which will be distributed via an 11.02 Kilometer power distribution line network and 3 transformers. The solar power plant is supported by a 70Kva standby diesel-powered generator.

Apart from Wasini Island, electricity mini-grids are also being implemented in Mageta Island in Siaya County, Ngodhe and Takawiri Islands in Homabay County, Kaeris and Kerio markets in Turkana County and Dabel Market in Marsabit County.

All these projects are being implemented by the Government of Kenya through RREC under the Kenya Electricity Modernization Project (KEMP) solar mini grids

“  
The Wasini/  
Mkwiro Solar  
Power mini-  
grid will serve  
as an inspiring  
example for other  
underserved  
communities,  
highlighting the  
transformative  
potential of  
renewable energy.”

subcomponent, which is a World Bank funded facility aimed at increasing access to electricity in the country in an effort to achieve universal access to energy.

President Ruto was hosted by the RREC Board of Directors led by the Chairman, Mr. Godfrey Lemiso and the management team led by Ag. Chief Executive Officer Dr. Rose Mkalama. Also present were senior Government officials led by the Cabinet Secretary, Ministry of Energy and Petroleum Mr. David Chirchir, Principal Secretary, State Department for Energy, Mr Alex Wachira, the Governor of Kwale County Ms. Fatuma Mohamed Ahani and area Member of Parliament Hon. Chiforomodo Mangale Munga among other leaders and residents who expressed their gratitude to President Ruto and RREC for making this long-awaited dream a reality.



*737 Kilowatts per hour Wasini/Mkwiro solar power plant powering 600 households in Wasini & Mkwiro villages.*



# It's A Wrap

## OUR MANDATE

To spearhead Kenya's renewable energy drive in addition to implementing electrification projects.

**REREC**  
Renewable Energy Research & Development Corporation

www.rerec.co.ke



## CPA Peter Mbugua Retires From the Helm of REREC

In the grand narrative of corporate prowess, there comes a moment when a chapter must close, leaving behind the echoes of a leader's footsteps and the indelible mark of their vision. As we gather the pages of REREC's history, we find ourselves at the juncture of both an end and a beginning – the retirement of our Chief Executive Officer, CPA Peter Mbugua, together with a number of employees who have served this organization relentlessly.

CPA Peter Mbugua joined REREC in 2012 as the Chief Accountant. He was appointed as the acting CEO in 2017, and confirmed as the CEO in 2018.

In the theater of leadership, CPA Peter Mbugua has been the protagonist; steering REREC through the twists and turns of success, leaving behind a script adorned with innovation, resilience, and a touch of audacity.

To honor Mr. Mbugua's outstanding career, the Board of Directors, top management and stakeholders joined hands to organize a farewell

ceremony that would honor not only the individual, but also the values and principles he instilled in the organization. The ceremony also marked the departure of several other long-serving employees who had devoted their lives to serving the nation through REREC.

In his retirement speech, Mr. Mbugua took a moment to express his gratitude for the collaborative efforts of the Board of Directors led by Mr. Godfrey Lemiso, acknowledging their pivotal role in REREC's success.

He spoke passionately about the challenges they had overcome, the projects that had transformed communities, and the collective spirit that had driven REREC to success.

The outgoing CEO also enthusiastically congratulated the newly appointed CEO, Dr. Rose Mkalama, commending her for her dedication throughout her career and wished her the best as she leads the Corporation to greater heights. He expressed his confidence in Dr. Rose, adding that he has known her as a hard worker, resilient and focused person.

Mr. Mbugua emphasized his confidence in the REREC Team saying that the talented individuals within the Corporation will continue to light up lives and power the dreams of all Kenyans through rural electrification and advancement of renewable energy in the Country.

The retirement ceremony was a poignant moment as the colleagues, with decades of collective experience, stood together on the stage, symbolizing the passing of the baton to a new generation of leaders. The legacy they left behind would be remembered not only in the organizational records but in the hearts of those whose lives had been touched by the light they had collectively brought to countless communities.

As the curtains draw to a close on this remarkable chapter, the Corporation expresses its heartfelt thanks to each one of the retirees and wishes them a fulfilling and well-deserved retirement filled with joy, relaxation, and new adventures.



*Retired officers with REREC CEO Dr. Rose Mkalama, GM, Renewable Energy Research & Development Eng. Fred Ishuga, GM, Finance & ICT Davis Cheruiyot, Ag. GM IEC Beatrice Njuguna among other staff during the farewell celebration.*





# Change of Guard

Meet Dr. Rose Mkalama,  
the newly appointed REREC CEO



In a historic move that has shattered the glass ceiling, the Cabinet Secretary, Energy and Petroleum Mr. Davis Chirchir, EGH, has appointed Dr. Rose Mkalama as the Chief Executive Officer of the Rural Electrification & Renewable Energy Corporation (REREC), achieving a significant milestone as the first woman to assume this leadership role at the Corporation. Dr. Rose Mkalama's appointment comes at a crucial time for the renewable energy sector, as the world grapples with the imperative to transition towards sustainable energy sources.

Dr. Rose Mkalama holds a Doctor of Philosophy (PhD) degree in Business Administration, specializing in Strategic Management and Performance, (University of Nairobi), Master of Laws in Oil and Gas (Strathmore University), Master of Business Administration (MBA) specializing in Human Resource Management, (University of Nairobi), and Bachelor's Degree in Law, LLB (University of Nairobi). She is also a Certified Public Secretary, a member of the Law Society of Kenya (LSK) and the Institute of Certified Secretaries (ICS).

Dr. Rose Mkalama's journey to the helm of REREC has been characterized by a relentless pursuit of excellence and a commitment to making a positive impact. She brings on board a wealth of experience in leadership and management of resources, having served the Corporation for over 15 years, at various senior management levels, most recently, as the General Manager, Information, Education and Communication (IEC).

As she steps into the role of CEO at REREC, Dr. Rose Mkalama faces the dual challenge of leading an organization at the forefront of regulating renewable energy while breaking gender barriers in an industry traditionally dominated by the male gender.



*REREC's Board Chairman Mr. Godfrey Lemiso (left) with the outgoing REREC CEO CPA Peter Mbugua (centre) & the newly appointed CEO, Dr. Rose Mkalama (right)*



Her journey is not just a personal triumph but a testament to the transformative power of breaking barriers and embracing diversity in the pursuit of a cleaner, brighter future.

Colleagues and industry experts alike commend her for the resilience and tenacity that have defined her career, anticipating that she will bring fresh perspectives and transformative leadership to REREC.

Her vision for REREC revolves around accelerating the adoption of renewable energy solutions and creating an environment that fosters innovation and collaboration. She envisions a future where Kenya becomes a global leader in sustainable energy practices, setting an example for other nations to follow.

In assuming the position of REREC's CEO, she not only takes on the responsibilities of steering the organization towards achieving 100% rural electrification but will also oversee the formulation and implementation of the Organization's fourth Strategic Plan 2023/2027. Her journey is not just a personal triumph but a testament to the transformative power of breaking barriers and embracing diversity in the pursuit of a cleaner, brighter future.

Dr. Rose Mkalama takes over from CPA Peter Mbugua, who recently retired after serving as the Corporation's CEO for the last six years.





# Energizing the Future

IEK's 30<sup>th</sup> International Convention and REREC's Vision for Sustainable Energy in Kenya

The Institution of Engineers of Kenya (IEK) held its 30<sup>th</sup> International Convention from 14<sup>th</sup> to 17<sup>th</sup>, November 2023 in the sun-soaked coastal city of Mombasa. The convention, held under the theme "Engineering a New World," bore witness to the vibrant convergence of engineering minds and served as a nexus for groundbreaking discussions and collaborations aimed at shaping a sustainable future.

REREC, whose mandate is fulfilled mainly through the selfless works of our engineers, took part in the Convention as a sponsor, exhibitor, panellist and also by sending our Engineers to be part of the great convention.

“Beyond extension of the national grid to reach rural areas, we are focusing on electrifying communities that are in the off-grid areas

The Corporation's commitment to the Convention was not merely symbolic but a tangible expression of our belief in the transformative power of engineering.

The Convention's agenda featured a thought-provoking panel discussion on Energy for the Future of Kenya, where Dr. Rose Mkalama, REREC's

acting CEO, gave insights on the need to move beyond the conventional extension of the national grid stating;

"Beyond extension of the national grid to reach rural areas, we are focusing on electrifying communities that are in the off-grid areas, especially in the Northern Frontier Counties and Islands, through the installation of mini-grids" She said.



Her statement reflects the paradigm shift towards inclusive and sustainable energy solutions.

Dr. Rose Mkalama's emphasis on electrifying off-grid areas, particularly in the underserved regions, speaks volumes about REREC's commitment to bridging the energy gap in Kenya. The strategic deployment of mini-grids in these areas not only addresses the immediate need for electricity but also aligns with the broader goal of fostering economic development, improving living standards, and empowering communities.

A noteworthy feature at the convention was the 6<sup>th</sup> Women Engineers Summit, held on the first day of the event. The summit provided a platform for women engineers to share their experiences, challenges, and successes in a field traditionally dominated by the male gender.

Speaking during the Convention's closing ceremony, Ms. Beatrice Njuguna, Acting General Manager; Information, Education, and Communications (IEC) Directorate at REREC appreciated IEK for its unwavering dedication to advancing the engineering profession where REREC is a key stakeholder. She in particular acknowledged the



“Engineering is a process but it is possible. Embrace the power of your passion and let the journey be a testament to your limitless potential.

~Eng. Njangu Jackbed

“Engineering is futuristic. Endless opportunities await those who dare to imagine and innovate.

~Eng. Teresia Thuku

contribution and dedication of women engineers and challenged them to take up mentorship roles in high schools, universities and colleges to encourage the young ladies who aspire to join the engineering world. Her remarks reflected a forward-looking vision, recognizing the

importance of diversity in driving innovation and progress in the engineering sector.

We look forward to continued collaboration, knowledge sharing, and joint initiatives that will contribute to the sustainable development of our nation.



REREC Staff members led by the Ag. GM I.E.C, Beatrice Njuguna and GM Renewable Energy Research & Development Eng. Fred Ishuga championing renewable energy at the REREC stand.





# Launch of Strategic Plan

“The new strategic plan aligns perfectly with the government’s commitment to attaining universal access to electricity by the year 2026 and achieving universal access to modern and clean cooking, by 2028

The Corporation has launched a new Strategic Plan that aims to connect 1 million customers in rural areas through electrification of 15,000 public facilities and installation of 5,000 transformers. The Plan, which also aims at increasing clean energy contribution to the national grid by 18.372MWp was launched on 26th October, 2023.

Speaking during the launch ceremony, the Principal Secretary,

State Department of Energy, Mr. Alex Wachira commended REREC for the development of the Strategic Plan and emphasized his confidence in the successful implementation of the Plan. In his remarks, Mr. Wachira noted that REREC is dedicated to changing the landscape of the country by achieving 100% electrification by the year 2030.

The Board Chairman, Mr. Godfrey Lemiso, affirmed that the REREC

Board will offer unwavering support by providing policy direction, ensuring availability of adequate resources, and putting in place sound institutional frameworks, structures and policies that will ensure the successful implementation of the Plan.

Speaking in the same event, Board Director Mr. Milton Lucheri, who also serves as Chairman of the Strategy & Project Implementation



Committee, accentuated the Strategic Plan's audacious objective to electrify 10 times more clients every year to a tune of 200,000 clients per year compared to the previous Strategic Plan which targeted to electrify 20,000 clients per year. He stated that this 5th generation Plan will require funding of up to Ksh. 169 billion, and called upon the national government, county governments, development partners and other stakeholders to collaborate to help the Corporation achieve this ambitious Plan.

As the Corporation moves into the implementation stage, Acting Chief Executive Officer Dr. Rose Mkalama said, "We are aware of the fact that the Corporation has been relying heavily on exchequer funding for project implementation, but looking at the finance requirements of the strategic plan, there is a need to diversify funding sources for programs and projects. We shall, to this extent, be looking towards enhancing our partnerships to augment exchequer funding."

Dr. Mkalama added that the Corporation will re-orient its project implementation cycle, end-to-end for efficiency and effectiveness so that the Corporation can continue being responsive to emerging community needs and support Government programs effectively.

"Identification of electrification projects shall take cognizance of areas that have a low connectivity rate so that socio-economic transformation can be felt by communities across the country. The Corporation will also decentralize services to its regional offices to increase efficiency in the project implementation cycle and take services closer to the mwananchi," she said.

The Corporation was honored to have the presence of the Lamu Governor; H.E. Issa Timamy and Taita Taveta Governor; H.E. Andrew Mwadime, among other government representatives at the launch event. County governments are key stakeholders of the Corporation as they collaborate with REREC

through the Matching Fund programme which accelerates rural electrification in priority areas at the County and Constituency levels.

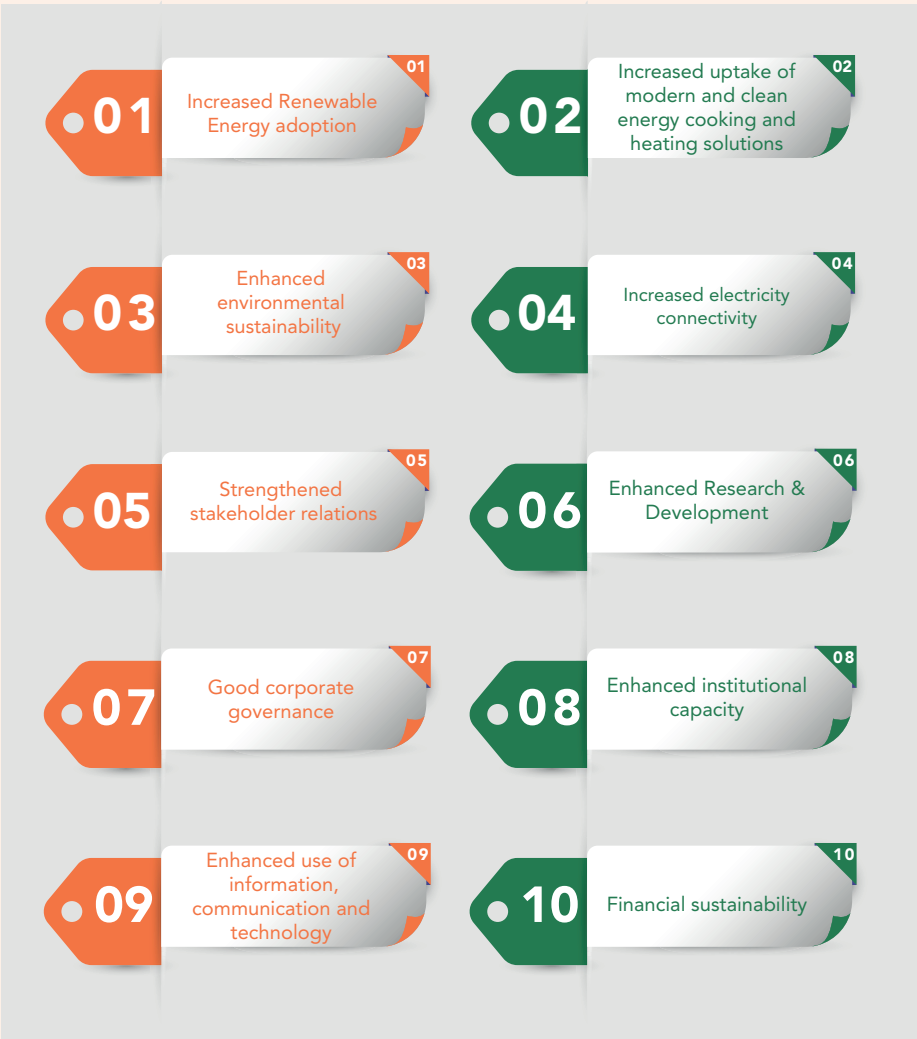
REREC's new strategic plan aligns perfectly with the government's commitment to attaining universal access to electricity by the year 2026 and achieving universal access to

modern and clean cooking, by 2028; two (2) years ahead of the global goal set out in SDG 7. To achieve this, the Corporation aims to facilitate increased access to training and capacity building of artisans in energy centers and increase the number of renewable energy technologies demonstrated in these centers.

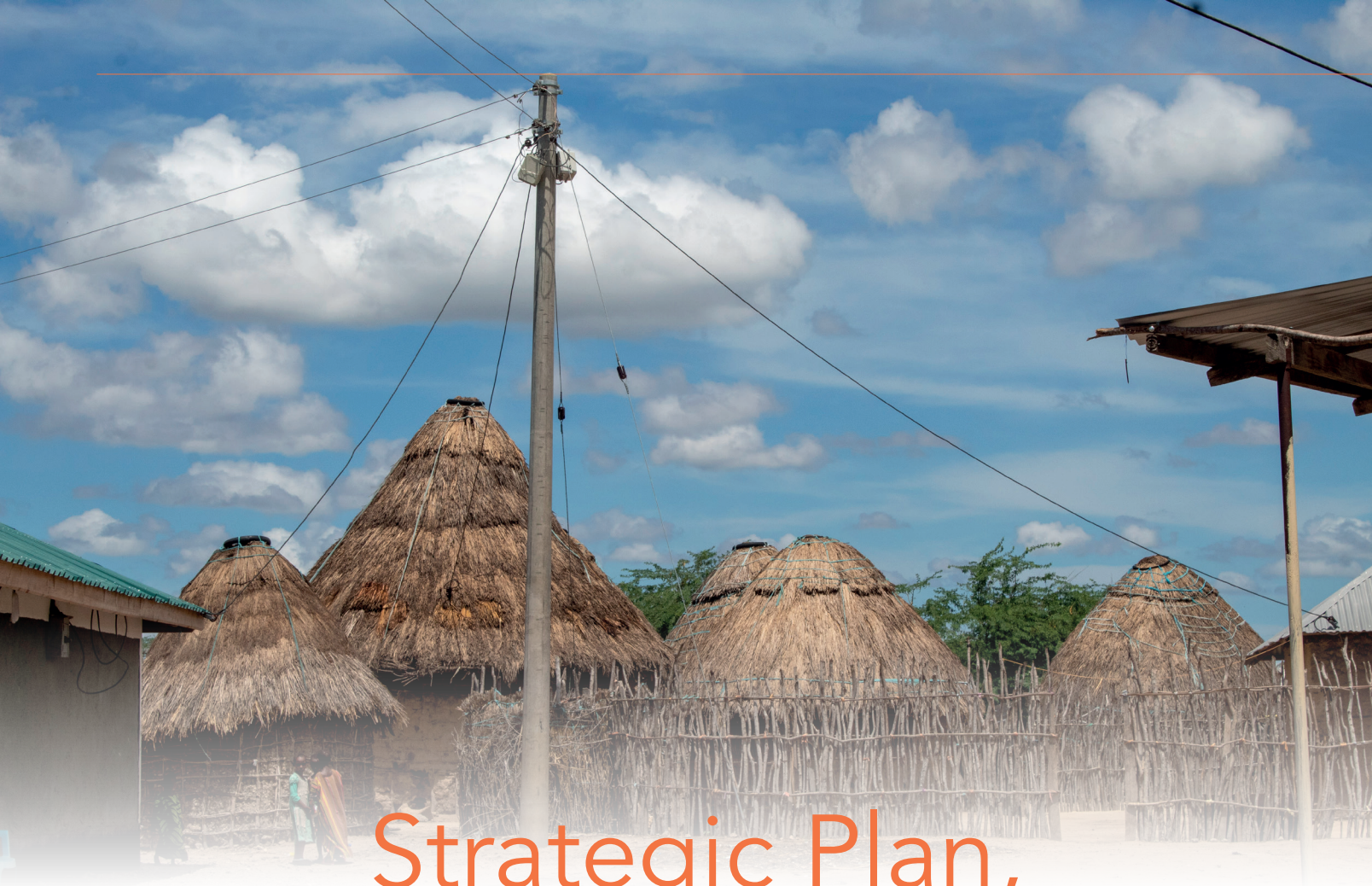


Unveiling moment during the launch

Key strategic objectives of the Strategic Plan.







# Strategic Plan, A Focus On Our Projects

By Eng. Jonathan Mbutu

Energy access is a critical factor in reducing poverty and a fundamental means to achieving sustainable development in the economy. By developing adequate infrastructure that provides consistent and affordable access to energy, the local communities can significantly improve their standards of living and enhance their economic status through; a healthier home environment, access to new productive activities and improved education, health, security, among other benefits.

In line with these, REREC has developed its 5<sup>th</sup> strategic plan (2023-2027) to mirror the Corporation's expanded mandates and the Kenya Kwanza Government's agenda.

“The Mission of the Corporation is to provide energy solutions for all through renewable energy and rural electrification for social economic transformation.

According to the Strategic Plan, the Mission of the Corporation is to provide energy solutions for all through renewable energy and rural electrification for social economic transformation.

The strategic plan identifies the following key projects that will propel the nation to achieve 100% rural connectivity as well as mitigate the effects of climate change.

- i. Diesel mini-grids hybridization
- ii. Secondary schools for solar PV installation
- iii. Health facilities for solar installation
- iv. Public boreholes for solarization
- v. New solar mini-grids in northern parts of Kenya and other areas far from the grid
- vi. Last mile projects for underserved counties



## Diesel Mini-Grids Hybridization

The Corporation has developed 20 Isolated Diesel Gen-set Power stations and connected 22,520 customers in off-grid areas of the Country. Over time, power demand from customers connected to the Isolated Diesel stations has increased, consequently, the need to upgrade some of the stations. Currently 7,020 customers who have been identified for connection in these areas cannot be connected due to limited capacities of the diesel generators.

The Corporation has, to date, upgraded seven of the diesel power stations and currently upgrading Kamorliban diesel power station with a 500KVA diesel generator.

The operational and maintenance of the diesel power plant cost is high. This has been compounded by the recent increase of cost of petroleum products. The aging engines also break down frequently affecting power supply reliability to the connected customers. There are also environmental implications in running a large fleet of big diesel engines across various parts of the country, this negatively affects the Corporation and Country carbon footprint.

For environmental sustainability as well as to lower the cost of operating the diesel stations, the Corporation has identified 19 diesel power stations for hybridization. The proposed solar hybridization capacity is 18,852kW at an estimated cost of Kshs. 10.3billion.

## Secondary Schools for Solar PV Installation

Rural Electrification and Renewable Energy Corporation (REREC) was mandated to undertake electrification of all primary schools which did not have power supply to facilitate the Digital Learning Program. The program has been a great success with over 23,000 primary schools connected through grid extension and 4,883 schools installed on solar.

However, secondary schools in areas far from grid are yet to be electrified and this has seen them lag behind in Digital Learning Program.

The Corporation has identified 91 secondary schools for solar PV installation. The project will cost approximately KShs. 355.5million. This will enable the beneficiary schools improve on their performance as well as enable the students acquire relevant skills that will prepare them for future careers in the digital space.

## Health Facilities for Solar Installation

United Nations University – World Institute for Development Economics Research (UNU-WIDER) research paper No. 2007/83 model predicts that a significant number of deaths, of children under five years, can be averted by providing access to electricity, improving the education of women, providing sanitation facilities and reducing indoor air pollution. Therefore, electricity connection to health facilities can help to reduce infant mortalities.

The Corporation has identified 261 health facilities for electrification through solar. The project cost is estimated at a cost of Kshs. 1.2billion.

## Public Boreholes For Solarization

REREC in Collaboration with Kisumu County Government implemented a solar water pumping project at Nyakach water treatment plant. Further, through the Matching Fund program, the Corporation partnered with the County Government of Nyeri for solarization of 23 boreholes. Some of the boreholes were previously not operational because they had been disconnected from power supply due to pending electricity bills or the cost of running the diesel generators which was too high for the community to bear. The solarization of the boreholes has therefore been transformational to the communities in many ways.

Under the World Bank funded KOSAP program, the Corporation plans to solarize 380 boreholes in 14 counties.



*Solarized Borehole in Nyeri County*



However, despite the efforts the Corporation has made, the population of the boreholes requiring solarization in the country remains high. Towards this, the Corporation has identified 694 community boreholes for solarization. The project is estimated to cost approximately KShs. 8.3 billion.

### New solar mini-grids in northern parts of Kenya and other areas far from the grid

Mini-grids provide a more economical option for electrification of markets and public facilities beyond 50km from the grid compared to grid extension. Traditionally, the strategy of Kenya's government for increasing access to electricity has focused on national grid extension. Other available options, such as off-grid solutions in rural areas, have been pursued with lower priority. With rapidly improving technologies, off-grid solutions are well placed to provide affordable electricity services especially in rural areas.

Energypedia's report of 2019 finds that, in Kenya between 660,000 and 2.1 million household connections

will most cost-effectively be provided through mini-grids, representing 17-58% of the non-electrified households in rural areas. Based on this range, mini-grids in Kenya could supply between 180 and 570GWh of electricity by 2030. This emphasizes the importance of mini-grids in achievement of the Government's universal access plan by 2030.

Through the implementation of the renewable energy activities such as establishment of the mini grids, the Corporation targets to increase its contribution to clean energy from 60.498 MWp in 2022 to 78.870MWp by 2028, for environmental sustainability. As such, the establishment of the proposed renewable energy mini grids will not only have the direct economic benefit to the economy but also contribute greatly to mitigation on climate change. The Corporation therefore through implementation of the renewable energy mini grids will enhance its opportunities offered under carbon financing and the green energy climate fund. This is one of the Corporation's functions under the Energy Act 2019.

“Northern parts of the country remain underserved; with levels of electricity access being below 40% compared to the national access rate of 75%.

However, even with the efforts the Corporation has made in development of mini-grids, the Northern parts of the country remain underserved; with levels of electricity access being below 40% compared to the national access rate of 75%.



*Eliye Solar Minigrid in Turkana County*



# Stima Mashinani

## 300 Households in Kisauni Constituency Connected to Electricity

As part of our mission to provide electrification in the rural areas of Kenya, REREC is pleased to announce the successful completion and commissioning of the Mitedi and Nguu Tatu rural electrification project in Kisauni Constituency, Mombasa County. This project has connected 300 households in the two villages to electricity.

Speaking during the commissioning event, REREC's Board chairman, Mr. Godfrey Lemiso restated the Corporation's commitment to providing electricity in the rural areas adding that this will spur economic growth for the rural populace.

Dr. Rose Mkalama, Ag. C.E.O, REREC, encouraged the beneficiaries to use the electricity connected to start

economic activities that will generate income, and not to rely on electricity for lighting purposes only.

Currently, the Corporation is implementing 73 projects in the Coastal region, across the six counties of Kilifi, Kwale, Lamu, Mombasa, Taita Taveta and Tana River. Upon completion, the projects will benefit a total of 4,838 customers.



*REREC's Board chairman Mr. Godfrey Lemiso, REREC CEO Dr. Rose Mkalama and other Board Directors during the commissioning of Mitedi & Nguu tatu project in Kisauni Constituency.*



# Waste To Energy; Nairobi's Untapped Potential



By Eng. Maxwell Ngala

“There is need to consider recovering energy from municipal solid waste as part of the solution to the problems derived from increasing waste quantities

The management of municipal solid waste is a major environmental challenge in urban cities of the world. With world populations increasing and major economies scaling up production in cities, integrated waste management policies that include waste to energy are increasingly becoming important. It is estimated that by 2025, the global waste-to-energy potential will be 30EJ.

Kenya's population grew by 2.2% to 47.5 million in 2019, making it the third most populous country in

Eastern Africa behind Ethiopia and Tanzania. Close to 30% of the country's population lives in urban areas like Nairobi (the capital), Mombasa, Nakuru, Eldoret, Ruiru, and Kisumu. With a population growth rate of 4% per annum since 2000, Nairobi City is home to over 5 million people and it produces about 22% of Kenya's GDP. The city is a major industrial, communication, administrative and transport hub within East Africa.

## Municipal Solid Waste in the City of Nairobi

The municipal solid waste generated in Nairobi rose steadily on the back of increased consumption of goods by its growing population, lifestyle changes and the increasing wealth of the rising middle class from 1,500 tonnes in 1998 to 2,400 tonnes per day in 2017, pointing to the positive and causal relationship with GDP and population. Today, it is estimated at 4,016 tonnes per day.



Currently, about 33% of the waste is collected and disposed off at Dandora, the city's official single dumpsite. The remaining 67% is either dumped in open spaces and burnt or scavenged. This has posed significant environmental and health concerns and heightened calls for a proper waste management plan in the city.

The United Nation's Sustainable Development Goals, the UN Habitat's New Urban Agenda and the Africa Agenda 2063 all call for improvement in waste management practices and investment in environmentally sustainable and climate-resilient economies and communities.

This waste situation is particularly important when considered against the fact that Nairobi records the highest electricity consumption with 42% of all electricity sales, 5,605GWh annual consumption, and 930MW peak demand. Its annual electricity consumption is forecast to grow to 15,433 GWh by 2037.

Consequently, there is a need to consider recovering energy from municipal solid waste as part of the solution to the problems derived from increasing waste quantities (within a more extensive integrated waste management system) in Nairobi growing city and the rapidly increasing energy demands.

The Kenya Bioenergy Strategy identifies biodegradable municipal solid waste for biogas generation as one of the strategic activities in this regard.

Biomass is organic matter that has stored energy through photosynthesis and is available on a renewable basis. Biomass for energy is obtained from various sources including wood from natural forests and woodlands, agricultural residues, energy crops grown exclusively for energy production, urban wastes and refuse-derived fuels (municipal solid waste, sewage, industrial waste and household waste) and aquatic ecosystems. Biomass is used in various technologies and applications, ranging from traditional heat generation for cooking or space heating to modern



*Wastes land fields in Nairobi County*

combined heat and power generation or production of biofuels.

Kenya has developed at least two biogas plants powered by flower waste in Isinya (100KW) and Thika (55KW). Findings from the plants show that 1 ton of flower waste produced 60-80m<sup>3</sup> of biogas depending on the feeding rate and temperatures and that 1m<sup>3</sup> of biogas produced 0.94kWh of electricity to run borehole pumps in the flower farms.

Currently, the most globally used Waste to Energy technologies are incineration and methane capture in landfills. Nevertheless, these technologies have some limitations. On the one hand, incineration is not advisable for most of the organic MSW (i.e., food and yard waste), whose average calorific value and high moisture content make them not a recommended feedstock.

On the other hand, landfill gas recovery is a method applied to mitigate the emissions of methane produced through the decomposition of the organic MSW. It has been widely implemented in developing countries under the funding of the Clean Development Mechanism from the Kyoto Protocol, which allowed for payment of the operating costs of landfills with the payments from carbon credits. Nonetheless, projects for landfill gas capture are still few in Africa in comparison with implementation in the US and many European countries.

Anaerobic Digestion in reactors is a third Waste to Energy process which is very attractive for use with biowaste. This is performed in mechanical-biological treatment (MBT) plants, where the waste is mechanically processed (pre-treatment) before being fed to the reactors, with the aim of removing unwanted items from the incoming waste stream.

A review of studies on bioenergy potential from municipal solid waste in Nairobi City County conducted by this writer shows that the estimated annual energy potential from methane gas recovery in landfill sites is 255, 597. 333 MWh while the estimated power production from thermal technologies (incineration) is 236,733.160MWh (assuming a 30% generation efficiency). Given the advantages of the biological route over the thermal route in environmental sustainability and the particulate emission from incineration, it is recommended as a suitable technology for harnessing this potential. To put this in perspective, REREC's Garissa solar power plant's total generation from November 2018 to October 2021 (3 years) was 262,206.58MWh.

Little wonder then that the Kenya Electricity Generating Company partnered with the Nairobi Metropolitan Services in 2020 to set up a 45MW waste-to-energy power plant in Ruai, Kasarani Subcounty, Nairobi City County.





# Sustainable Aviation in Africa.

## Could Kenya take the lead?

By Jefferson M. Ireri

The aviation industry faces a major challenge in reducing its greenhouse gas emissions and mitigating its impact on climate change. According to the International Civil Aviation Organization (ICAO), international aviation accounted for about 1.3% of global CO<sub>2</sub> emissions in 2018. According to the International Energy Agency (IEA), aviation accounted for 2% of global energy-related CO<sub>2</sub> emissions in 2022, having grown faster in recent decades than rail, road or shipping. As international travel demand recovers post COVID-19 pandemic, aviation emissions in 2022 reached almost 800 Mt CO<sub>2</sub>, about 80% of the pre-pandemic level.

To address this challenge, ICAO has adopted a comprehensive approach that includes a basket of measures,

“The first Kenya Airways (KQ) flight fuelled by Sustainable Aviation Fuel (SAF) departed from Nairobi in May 2023.

such as technological innovations, operational improvements, market-based measures, and the use of Sustainable Aviation Fuels (SAF). SAF are renewable or waste-derived fuels that can replace conventional jet fuel and reduce the life cycle CO<sub>2</sub> emissions of aviation by up to 80%.

One of the key market-based measures adopted by ICAO is the Carbon Offsetting and Reduction

Scheme for International Aviation (CORSIA), which aims to stabilize CO<sub>2</sub> emissions from international flights at 2020 levels through carbon offsetting. Under CORSIA, airlines are required to monitor, report and verify their CO<sub>2</sub> emissions, and purchase emission units from approved projects that reduce or avoid greenhouse gas emissions in other sectors.



One of the ways that airlines can reduce their offsetting obligations under CORSIA is by using SAF which meets the sustainability criteria set by ICAO. These criteria ensure that SAF have real environmental benefits on a life cycle basis, and also consider other aspects such as social and economic development, food security, biodiversity, water and land use.

However, the production and use of SAF faces several barriers, such as high costs, limited availability, technical challenges, regulatory uncertainty, and lack of awareness and acceptance. REREC being at the forefront of advocating for the adoption of renewable energy we emphasise on the need for concerted efforts from all stakeholders, including governments, industry, civil society, and international organizations, to overcome these barriers and scale up SAF deployment.

In this context, Kenya has a unique opportunity to become a leader in SAF production and use in Africa and beyond. Kenya has abundant biomass resources that can be used as feedstock for SAF production, such as croton, cotton and castor seeds,

agricultural residues, and waste oils. These feed stocks do not compete with food crops or cause land use change. They instead provide income and livelihood opportunities for farmers and communities in arid and semi-arid areas.

Moreover, Kenya has a strong commitment to climate action and sustainable development, as reflected in its updated Nationally Determined Contribution (NDC) under the Paris Agreement, its bioenergy strategy, its national development plans, its Vision 2030 and the Energy Act which gives REREC a mandate to promote renewable energy including bio-fuels. Kenya is also a participant in CORSIA and has expressed its support for ICAO's long-term aspirational goal of net-zero carbon emissions from international aviation by 2050.

To realise this potential, Kenya has already taken some important steps. The first Kenya Airways (KQ) flight fuelled by Sustainable Aviation Fuel (SAF) departed from Nairobi in May 2023. Kenya has therefore become the first to use this type of biofuel for a long-haul journey from the African

continent, given that the flight in question was headed to Amsterdam. The Government has also signed a memorandum of understanding with companies operating in the country to promote the decarbonisation process through new industrial models of a fully integrated circular economy along the whole biofuel production value chain.

In addition, in August 2021, Kenya began the production of crude biofuel from croton, cotton and castor seeds. The crude biofuel will be refined into petroleum products such as petrol, diesel, gas and lubricants that can be used for various purposes including aviation. This was the first project of its kind in Africa that uses local feed stocks to produce biofuels that meet the CORSIA sustainability criteria.

These initiatives demonstrate Kenya's leadership and innovation in developing SAF that can contribute to reducing aviation emissions while also creating social and economic benefits for its people. By doing so, Kenya can set an example for other countries in Africa and beyond to follow suit and join the global effort to decarbonize aviation.





# National Tree Planting Day



## A Nation's Quest for a Sustainable Future

The rising temperatures, erratic weather patterns, and the looming threat of environmental degradation has prompted the Kenyan government to embark on a transformative journey to save our planet from the effects of climate change.

Led by President William Ruto, Kenya is proactively leading the Continent to speak in one voice and take a center stage in the world's climate change conversation. So deliberate are these steps that the Country has embarked on a nationwide campaign for tree planting, reducing carbon emission and even setting aside a public holiday dubbed National Tree planting day to rally the citizens across the country to #JazaMiti.

Under this ambitious initiative, the people of Kenya, led by the president, H.E William Ruto, united to plant millions of trees across the country. Every citizen, from bustling cities to remote villages, took up the call to action. Schools, community groups, and businesses joined forces, turning tree-planting into a national movement.

Amidst this green revolution, the Corporation, seized the moment to advocate for the integration of renewable energy in Kenya's fight against climate change.

The Corporation, through the regional Energy Centers, joined millions of Kenyans to promote the benefits of renewable energy, and plant as many trees as possible on this day. REREC's staff championed the tree planting exercise in schools and public areas across the country.

As tree planting events unfolded, the Corporation's acting CEO, Dr. Rose Mkalama joined Mr. Muhammed Liban, Principal Secretary for the State Department for Petroleum at Kiboito village in Kericho for the National Tree Planting Initiative. They took time to enlighten communities on the importance of growing trees and saving our rain catchment areas. Further, they urged Kenyans to desist from cutting down trees and instead use modern and clean cooking methods.

REREC has 16 Energy Centers which have stocked different types of tree seedlings. The Centers are a rich source of information on tree management and advisory on the right seedlings to plant in different locations in the country. They also offer programs, trainings and demonstrations to individuals and groups on renewable energy technologies.



# Empowering Lives



## CSR Initiative to Electrify Al Mansoor Children's Home

For years, Al Mansoor Children's Home in Nguu Tatu, Kisauni Constituency, Mombasa County has been a safe haven for tens of children who, for one reason or the other, needed a place to call home. However, the absence of electricity posed a considerable hindrance to the quality of life for these young souls.

While on the normal routine to undertake electrification projects in the rural areas of Kenya, REREC's officials visited Al Mansoor Children's Home and they could vividly see the dire need in the facility.

In collaboration with local authorities in Nguu Tatu, and the Al Mansoor Children's Home management, REREC embarked on a mission to finance and undertake the electrification of the facility. A pole here, numerous cables here and there, bulbs and finally the big switch that illuminated not just the lives but also the dreams of the Al Mansoor children. This initiative will lead to better education standards, improved healthcare, and a safer and more conducive living environment for the children.

There is more to it. Being cognizant of the fact that education plays a key role in breaking the poverty cycle, the Corporation cleared school fees arrears for the children in the home and also pledged to offer financial support to cover school fees, educational materials, and extracurricular activities, ensuring that the children have access to a holistic education.

The Home was started in 2019 with only six children and so far, provides shelter for about thirty (30) children aged between seven (7) and eighteen (18) years old.

“This initiative will lead to better education standards, improved healthcare, and a safer and more conducive living environment for the children.”



# Through the Lens



REREC's CEO Dr. Rose Mkalama and some of the retired officers during the farewell celebration.



The President H.E. Dr. William Ruto accompanied by REREC Board of Directors led by Mr. Godfrey Lemiso (center) Mr. Milton Lucheri (far left) and Mr. Hussein Mohammed (far right) with REREC CEO. Dr. Rose Mkalama walking towards the Wasini/Mkwiro Solar mini grid ahead of commissioning.



# Through the Lens



REREC's Eng. Maxwell Ngala taking delegates at the IEK convention through REREC's rural electrification model at the exhibition stand.



REREC's Board Chairman Godfrey Lemiso, speaking to Mtwapa residents during the Mtwapa Energy Center open day.



# We leverage on collaborations to ensure we reach the most remote areas in the country.

Is your County or Constituency signed up for the Matching Fund Program yet? Here is how it works.



REREC Partners with County Governments & National Government Constituency Development Fund (NG-CDF) under a collaboration dubbed “a shilling for a Shilling”, also known as the matching fund program, to supplement funding of projects and accelerate rural electrification in the rural areas.

Since **2014/2015** financial year, the Corporation has executed **1,050** matching fund projects at a cost of **Ksh 2.8 Billion**. Some of the Counties that have participated include:

**KSHS**  
**2.8**  
**BILLION**

**1,050**  
**PROJECTS**

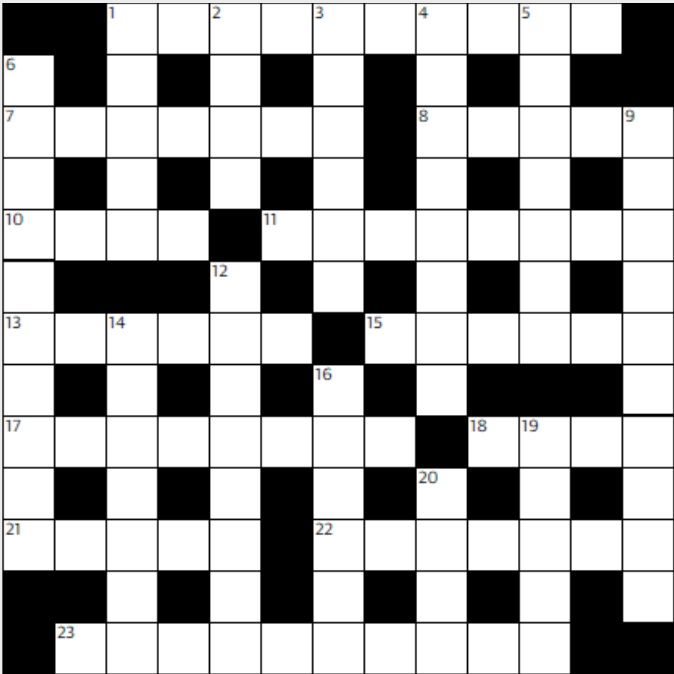
Bomet	✓	Kitui	✓
Busia	✓	Machakos	✓
Embu	✓	Makueni	✓
Kakamenga	✓	Meru	✓
Kiambu	✓	Nyandarua	✓
Kilifi	✓	Nyeri	✓
Kirinyaga	✓	Tharaka Nithi	✓
Kisumu	✓	Vihiga	✓
Lamu	✓	Uasin Gishu	✓

For any inquiries write to us on [info@rerec.co.ke](mailto:info@rerec.co.ke)

\*Several Constituencies have also signed up for the matching fund program.



# CrossWord Puzzle



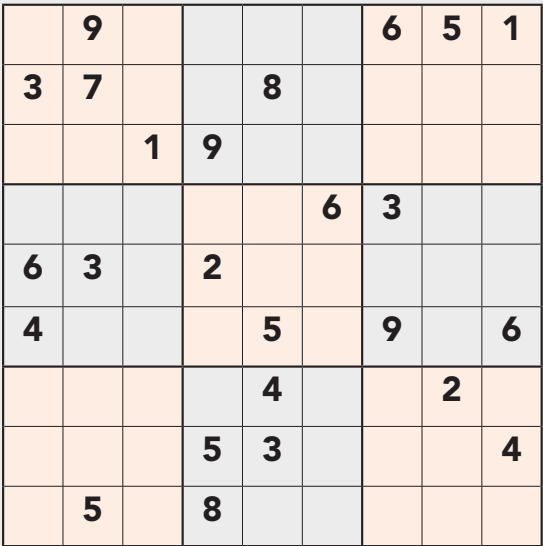
### Across

- 1 Stingy individual (10)
- 7 Rear or red? (7)
- 8 Provoke (wrath) (5)
- 10 Squeal – or make a whistling sound (4)
- 11 Pigs' feet – or horses? (8)
- 13 Topple (from power) (6)
- 15 British local government and healthcare union (6)
- 17 Three-hulled sailing boat (8)
- 18 Former (4)
- 21 Wireless communication (5)
- 22 Race organiser (7)
- 23 They may be rhythmic – or mental (10)

### Down

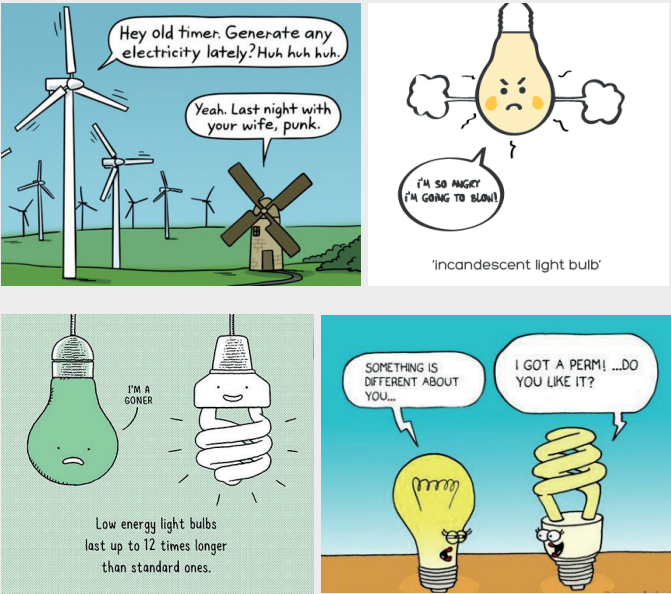
- 1 Spice popular in Indian cookery (5)
- 2 Countess's husband (4)
- 3 Trivial (6)
- 4 Activity of les tricoteuses (8)
- 5 Touted items (7)
- 6 Make the grade (4,6)
- 9 Surge (6,4)
- 12 Biscuit made with almonds or coconut (8)
- 14 Slender, insubstantial (7)
- 16 Failings (6)
- 19 Gather (5)
- 20 Fancy food shop (4)

# Sudoku



Fill in the Sudoku grid of 9 x 9 with Each row, column and square (9 spaces each) needs to be filled out with the numbers 1-9, without repeating any numbers within the row, column or square.

# On a Light Note





# The Highlight

Quarterly Newsletter

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## Energy Centres

Bukura Energy Centre  
Within Bukura ATC  
P.O. Box 92-50105 Bukura

Jamhuri Energy Centre  
Nairobi, showground  
P.O. Box 21552-00505 Nairobi

Lodwar Energy Centre  
Off Lodwar to Lorgun road  
P.O. Box 501-30500 Lodwar

Mirangine Energy Centre  
Mirangine, Nyandarua County  
P.O. Box 142-20124 Mirangine

Busia Energy Centre  
Busia Town next to Busia Market  
P.O. Box 421-50400 Busia

Kericho Energy Centre  
Off Kisumu road  
behind Siloam Hospital  
P.O. Box 1959-20200 Kericho

Marsabit Energy Centre  
Within Marsabit County  
Commissioners Office  
P.O. Box 143-60500 Marsabit

Mtwapa Energy Centre  
Mtwapa, Kilifi County  
P. O. Box 32 - 80109 Mtwapa

Garissa Energy Centre  
Off Garissa to Sankuri Road  
P.O. Box 1253-70100 Garissa

Kisii Energy Centre  
Within Kisii ATC  
P.O. Box 2238-40200 Kisii

Migori Energy Centre  
Migori town next to the County HQ  
P.O. Box 329-40400 Migori

Wajir Energy Centre  
Wajir town  
P.O. Box 414 -70200 Wajir

Uasin Gishu Energy Centre  
next to Kiplombe cemetery  
P.O. Box 9050-30100 Eldoret

Kitui Energy Centre  
Next to Kitui High School  
P.O. Box 737-90200 Kitui

Mitunguu Energy Centre  
Mitunguu market  
P.O. Box 232-60204 Mitunguu

Wambugu Energy Centre  
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P.O. Box 1400-10100 Nyeri



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