ISSUE NO. 002 | JULY 2024

THE ENERGY POST

Masinga Dam Not Posing Floods Threat

Empowering Kenyan Villages

Power Beyond Borders

World Bank's Quest to Pioneer Green Transitions and Universal Access in Africa

Exclusive Interview Eng. Peter Njenga

www.kengen.co.ke

THE MEN'S FIRE CIRCLE 2024

KenGen, in collaboration with Radio Africa Group (RAG), hosted the Men's Fire Circle event on May 30, 2024, at Matteo's in Karen. This gathering provided a vital platform for men to engage deeply with critical issues impacting their lives at work and at home. Participants had the opportunity to explore and discuss topics such as mental health, career advancement, and personal development. The event aimed to foster open dialogue and support among men, encouraging growth and resilience in both personal and professional spheres. Key figures at the event include : KenGen Managing Director & CEO Eng. Peter Njenga, Radio Africa Group CEO Patrick Quarcoo, Patron KenGen Blue Energy Henry Ithiami, Google Regional Director, Sub-Saharan Africa, Government Affairs and Public Policy Charles Murito, Managing Partner Momentum Africa Nzioka Waita MBS, CBS , KenGen General Manager Geothermal Development Pekesta Mangi KenGen Investment Manager Paul Wambugu, Senior Pastor of Parklands Baptist Church Rev. Ambrose Nyangao and Parapet cleaning services Group CEO Alex Nyaga.

A Word from the Managing Director and CEO

In this edition, you will find great insights into our endeavors, from our exclusive interview shedding light on KenGen's journey and vision to stories of transformation and progress in energy access across Eastern Africa.

Dear Readers,

As we present to you this second edition of The Energy Post Magazine, it fills me with pride and gratitude to address you. KenGen's commitment to excellence and innovation in the energy sector is unwavering, and it is with great pleasure that I share some reflections with you.

Since our inception, KenGen has been at the forefront of pioneering advancements in the energy landscape of Kenya and beyond. Our dedication to providing reliable and sustainable energy solutions has been the cornerstone of our success. Today, as we navigate through the dynamic challenges and opportunities in the industry, I am reminded of the words of educator and author Peter Drucker, "The best way to predict the future is to create it."

In this edition, you will find great insights into our endeavors, from our exclusive interview shedding light on KenGen's journey and vision to stories of transformation and progress in energy access across Eastern Africa.

Our commitment to collaboration and innovation resonates deeply in each article, reflecting our tireless efforts to drive positive change and foster sustainable development.

As we continue to strive for excellence, I am confident that our collective efforts will pave the way for a brighter, more sustainable future. Together, we have the power to shape a world where energy knows no borders, where access is universal, and where innovation thrives.

I extend my heartfelt gratitude to our readers, partners, and stakeholders for their unwavering support and commitment. Your trust and confidence inspire us to push the boundaries of possibility and chart new frontiers in the energy sector.

Together, let us forge ahead with determination and resilience, knowing that the path to excellence is illuminated by our shared vision and collective efforts.

Enjoy the read!

Eng. Peter Njenga, Managing Director and CEO

Message from the Editorial Director

"With The Energy Post, KenGen is committed to delivering content that informs, inspires, and empowers our readers. From in-depth interviews with industry leaders to thought-provoking analysis and commentary, our goal is to spark meaningful conversations and drive positive change in the energy sector."

Dear Readers,

We are honored to present to you a captivating array of articles that delve into the heart of Africa's energy landscape and peer into the possibilities found beyond our borders.

In this edition, we embark on a journey of exploration and discovery, uncovering the transformative potential of renewable energy, the power of collaboration, and the imperative of sustainability. Each article provides a comprehensive overview of the challenges and opportunities shaping our industry today.

With The Energy Post, KenGen is committed to delivering content that informs, inspires, and empowers our readers. From in-depth interviews with industry leaders to thought-provoking analysis and commentary, our goal is to spark meaningful conversations and drive positive change in the energy sector.

As we navigate through the complexities of a rapidly evolving world, our dedication to journalistic integrity and excellence remains unwavering. We strive to uphold the highest standards of accuracy, objectivity, and transparency in all our endeavors, ensuring that our readers can rely on us as a trusted source of information and insight.

I would like to express my sincere gratitude to our talented team of writers, editors, and contributors for their hard work and dedication in bringing this edition to life. Their passion and commitment shine through in every word, reflecting our shared commitment to excellence and innovation.

To our readers, I extend my warmest thanks for your continued support and engagement. Your feedback and input are invaluable to us as we strive to deliver content that meets your needs and exceeds your expectations.

I invite you to immerse yourself in the rich tapestry of stories and ideas presented in this edition of The Energy Post Magazine. May it inspire you, challenge you, and ignite a passion for positive change in the world of energy.

Get reading!

David Muthike, General Manager, Commercial Services

Message from the Editor

"Throughout these stories, one theme remains constant: the power of collaboration, innovation, and sustainability to drive positive change in the energy sector.

As we navigate through a period of unprecedented change and uncertainty, let us draw inspiration from these stories and join together in shaping a brighter, more sustainable future for generations to come."

Dear Readers,

Welcome back to The Energy Post Magazine!

In this edition, we embark on a journey through the heart of Africa's energy landscape and beyond, exploring the transformative power of renewable energy, the imperative of sustainability, and the collaborative efforts shaping the future of the energy industry.

Our cover story takes us on a fascinating exploration of the World Bank's quest to pioneer green transitions and universal access in Africa. Through an exclusive interview with Erik Fernstrom, Practice Manager for Energy in East Africa, we gain valuable insights into Africa's evolving energy landscape, with a particular focus on Kenya and its neighboring countries.

We also have the privilege of sitting down with Eng. Peter Njenga, KenGen's Managing Director, and CEO, as he shares his inspiring journey and vision for the future of KenGen. From discipline and hard work to ordained leadership, Eng. Njenga's story is a testament to the promise of excellence and innovation.

Our exploration of regional collaboration and sustainable energy solutions continues with a deep dive into the Eastern Africa Power Pool's consideration of opening its doors to private energy players. Through collaboration and innovation, the EAPP seeks to boost energy access and power trade across Eastern Africa, paving the way for a more interconnected and resilient energy ecosystem.

As we look ahead to the urgent challenges of climate change, we reflect on Africa's path to a sustainable future and the pivotal role of events like the Africa Climate Summit and COP28 conference. These gatherings underscore the pressing need for decarbonization and set the stage for a greener and more sustainable future for the continent and the world.

Our journey through the magazine also takes us to Masinga Dam, where KenGen's efforts to address the issue of climate change and ensure steady electricity output are making a tangible impact. We also witness the transformative power of energy access in rural villages like Balesa, where the introduction of solar mini-grid power stations is illuminating lives and driving positive change.

Throughout these stories, one theme remains constant: the power of collaboration, innovation, and sustainability to drive positive change in the energy sector. As we navigate through a period of unprecedented change and uncertainty, let us draw inspiration from these stories and join together in shaping a brighter, more sustainable future for generations to come.

Thank you for joining us on this journey. I hope you find inspiration, insight, and empowerment within these pages.

Enjoy the read!

Frank D. Ochieng, Marketing and Corporate Communication Manager

Our Team

Editorial Director
David Muthike

Editor
Frank D. Ochieng

EditorialTeam

1. Alex Misuko
2. David Muthike
4. Emmanuel Wandera
5. Ernest Nyamasyo
6. Evelyn Mwaura
7. Frank D. Ochieng
8. Isaac Asienwa
9. James Obondo
10. Maggie Ogutu
11. Paul Kimanzi
12. Peter Ndirangu
13. Peter Ngachuro
14. Philip Mukusya
15. Sulea Murambi
16. Teresse Nduku
17. Tracy Keter
18. Wilson Kamau

Contributors

1. Frank D. Ochieng
2. Emmanuel Wandera
3. Evelyn Mwaura
4. Eng. Peter Njenga
5. Kenedy Wambua
6. Ahmed A. Godana
7. Anthony Kahindi
8. Saurabh Sharma
9. Poshia Musesya
10. Evelyn Wanyoike
11. Hydeen Ghacharia
12. Sulea Murambi
13. Albert Barongo
14. Lucy Njue
15. Raphael Obonyo
16. Lucy Muricho
17. Nancy Marangu
18. SIRO Robert
19. Thuo Njoroge
20. CPA Mary Muthui
21. Jackline Mercy
22. Mercy Ngui
23. Brenda Chebasa
24. Elizabeth Gakunga
25. George Aluru
26. Paul Kimanzi
27. Philip Mukusya

Table of Contents


WORLD BANK GRO
THE WORLD BANK
IBRD • IDA
IFC
International
Finance Corporation
MIGA
KenGen
Energy for the nation

Power Beyond Borders

World Bank's Quest to Pioneer Green Transitions and Universal Access in Africa

In an exclusive interview with Frank D. Ochieng, the Editor of Energy Post Magazine, Erik Fernstrom, the World Bank's Practice Manager for Energy in East Africa, offered valuable insights into Africa's evolving energy landscape. With a particular focus on Kenya and its neighboring countries, Erik shines a light on the transformative potential inherent in energy access, green transition initiatives, and regional power trade.

A new world is possible. Looking yonder to a time when universal access to electricity will be a reality, Africa is rising, fast becoming the eye of the new age of the Industrial Revolution. And the world is taking a keen interest if the story of the World Bank's energy predictions in the continent is anything to go by.

Drawing from his experience working in Rwanda, Nigeria, and now Kenya, Erik Fernstrom has witnessed firsthand Africa's rapid growth and potential for becoming a global hub of development.

Erik highlights the transformative potential of the East African Power Pool, emphasizing its role in fostering regional energy collaboration and enhancing access to electricity – clean energy.

His work, focusing on energy expansion and green transitions in East Africa, particularly Kenya, Uganda, Tanzania, and Ethiopia, aims to realize the dream of regional power trade - a vision already taking shape with Kenya and Ethiopia's daily energy exchanges further adding to the exchange with Uganda. He envisions full universal energy access or something close to it by the turn of the decade thanks to the expansion of power networks and access to citizens.

Erik believes that Nairobi, Dakar, Lagos, and Addis Ababa, are some of the most important cities in Africa based on entrepreneurial uptake, new business ideas, and collaboration to grow their economies. Hard as it may seem, the Swedish World Bank boss sees these nucleus cities as the face of the new frontier of economic uptick.

"Africa is where I think development and growth will be in the coming couple of decades. Africa finally is getting its act together when it comes to the expansion of the electricity network, expansion, and access to electricity for its citizens. I truly believe that in the coming decade, we can have full universal access or close to it, which will be transformational for the entire continent," he renders.

Erik boasts of the growing syndicate of Africa's power pool naming the connection of Cape Town to the Mediterranean as one of the achievements in the pipeline. "The vision is really to enable African countries that still have a rather small energy grid; for global comparison purposes, to be able to draw on a bigger pool of both demand and supply" Erik adds. With this development, countries can inject their surplus energy into markets that need it.

True to his words, under the World Bank's guidance, Kenya has made significant strides in geothermal energy, within the 40-year partnership with KenGen. This collaboration has not only bolstered Kenya's energy sector but also set a benchmark for planning and transparency in the region. Despite challenges, including community engagement and the complexities of grid codes, Erik remains optimistic about overcoming these hurdles through trust and cooperation.

He believes that multiple African countries can learn from Kenya's planning and transparency which has contributed to least cost planning and in turn giving consumers the best deal possible on the cost, quality, and reliability of electricity.

Despite the continuous and ongoing support, Erik stresses that the World Bank learnt a lot of useful lessons from community engagement with the inception of new projects, referencing the iconic 280MW project in Olkaria. "We have learned along the way that the best way to do projects, and the most efficient way to do projects long term, is to engage with people in the community early on, explain what the project is bringing, what it is bringing for the country, but also what the impacts will be for them."

"With the continuing expansion on the continent, new technologies have emerged in the market, including storage technologies, energy storage, and intermittent powers like solar and wind."

It may seem fine and dandy for the East African power pool, but it is not without its threats and challenges. Erik has witnessed some countries not wanting to be linked to another country because they do not trust their quality and stability which in turn costs them their clients and even threaten the very objective of attracting development partners and foreign investors.

Some of these issues touch on grid codes which are the systems of power trade and what the Bank describes as the 'software' of the power pool. "We've seen in other parts of the world, I won't mention them here, but where all this hardware was done, at great expense, all the theoretical systems were in place, but the countries don't trust each other, and trade and benefits are not realized." Erik narrates.

As an example of how trust and systems play into the effectiveness of the power pool, Erik recounts a time when back in his home in Sweden the power charges were three times more because Germany needed more power following the war in Ukraine. "Yes, benefits are immense, but you also have to share burdens when you're in a pool. But over time, it's usually beneficial for everyone."

The Power Pool's progress is undeniable, yet challenges remain, notably in extending electricity access to about 30% of Kenyans still off the grid and making energy affordable. Erik adds that many people live too far away to viably be connected to the grid, at least in the short term. "We need to leverage a whole toolkit of resources from solar kits on your roof, to mini-grids, and larger isolated operations."

Regardless of the growing transformation of power supply in Kenya and on the continent, affordability of the commodity continues to be a hindrance to uptake for users. Erik believes that consumers should not equate tariffs to costs. "Long term, the only way to sustainably reduce tariffs is to put a downwards pressure on the cost of supply". "In the delivery system, we're losing way too much power. We cannot lose every fifth unit we produce on the way to consumers. It's just not affordable. We also need to enable people to use electricity for income-generating purposes. How can we make sure that institutions are using electricity in a way to improve their services?" Erik echoes this as one of the solutions to make power more affordable.

As a way to deal with technical losses, the World Bank deploys the 80-20 rule, where typically 20% of the consumers cover 80% of their sales. So, they focus closely on this 20% ensuring they have corrected metering, their connections are serviced, and they are priced fairly. In addition, as a means to support independent power suppliers in Kenya, the World Bank backs up some of the commitments by the government in what is a partial risk guarantee. "And our sister organization MIGA, can also work with investors in providing assurance," relays Erik.

With the continuing expansion on the continent, new technologies have emerged in the market, including storage technologies, energy storage, and intermittent powers like solar and wind. Erik attests that while these developments are exciting, they are also complex, which requires much smarter control systems, but he is not worried about these new technologies as the continent is building capacity and competence in that space, which will meet the growing need for highly specialized skillsets in the new dispensation.

Beyond his professional achievements, Erik enjoys Nairobi's vibrant social life, from morning runs at the famed Karura Forest founded by Nobel laureate, the late Prof. Wangari Maathai, to exploring the city's culinary scene. Nairobi to him is the most important city in Africa, not for any reasons in particular but perhaps from the biases to a bustling city that has been home to him and his family for over three years. "We're enjoying it a lot, it's a great place to be especially now," he says with a smile as bright as Nairobi's sunshine.

His vision for Kenya's energy future is ambitious yet achievable, aiming for 100% renewable energy by leveraging geothermal, hydro, wind, and solar power, combined with innovative storage and grid solutions. "We have worked the numbers and therefore I really think that 100% renewable energy in Kenya, combining your geothermal, your hydro, and your wind and solar, with smart storage and smart grid is very feasible even before our target of 2030" he adds.

This vision not only promises a sustainable energy landscape for Kenya but also sets a precedent for the entire African continent's green transition. It is happening!

Eng. Peter Njenga's
Exclusive Interviews

PART 1: Eng. Njenga: The Wonder Engineer, A Guiding Light Illuminating the Path to Excellence

By Frank D. Ochieng and Evelyn Mwaura

We begin our second part exclusive interview with the Managing Director and CEO, Eng. Peter Njenga, as documented by KenGen Weekly Editor in Chief, Frank Ochieng and Evelyn Mwaura. Enjoy the read.

Frank: ***Please introduce yourself to team KenGen and other stakeholders.***

Peter: My name is Eng. Peter Njenga, Managing Director and CEO of KenGen. I have over 31 years' experience as an Electronic Engineer and I am happy to be joining KenGen. Indeed, KenGen is the shining light in electricity generation in Kenya (smiles warmly). I am thrilled to be part of this exceptional organization, the foremost contributor to electricity generation in Kenya. We take pride in setting the standard for reliable, safe and cost-effective electric energy in Kenya and beyond.

Frank: ***Take us through your upbringing. Where did you grow up? Talk about your family briefly.***

Peter: Some of these memories put you in a situation where you remember and appreciate where you come from. I was born into a family which is polygamous. My father is one of those men who believed in huge families. He was a true African man (chuckles). He had three wives and 33 children, all from one man. I am the firstborn from my mother's side - we were 11 siblings. That is a story that I perhaps will share another day.

Frank: ***Did growing up in a large family have an impact on you?***

Peter: Many of us were boys, so you can imagine what kind of competitive situation it was, but I must thank God because my father worked hard and ensured all of us got a good education (nods pensively). That is the legacy our parents bequeathed to us. (Faces the interviewer) Funny you should ask, but growing up I never distinguished who my mother was. We lived harmoniously as one big family. I enjoyed growing up in that kind of family, the competition notwithstanding. Some may say dealing with that kind of competition prepared us for the cut-throat hustle and bustle of work life. Maybe it did, or maybe not. Whatever lessons we picked, we make sure to use them in our daily lives.

Frank: ***What of the family you created? Are you man, with one wife?***

Pete : *(beaming* lightly) Unlike my father, I did not go with polygamy. I am happily married to Dr. Ann Kabura. She is a Medical Doctor and we have three adorable children, two girls and a boy. I am proud to be a father who has seen all his children through university (raises his eyebrows). The last born graduated this year in June from JKUAT University.

Frank: ***You have always insisted on wanting to be known as Peter Njenga rather than Waweru. Could you elaborate*** The ***on*** name ***that?*** Waweru has sentimental value **Peter:** to me because my mother gave it to me at birth (touches his heart). I reserve it for close friends and family who know my background. When someone calls me Waweru, that will either be a family member or a very close friend.

Frank: ***So, take me through your education, starting from primary, secondary*** As you ***and*** can ***beyond*** imagine,. for a person my **Peter:** age, my story is quite long, but I will try and summarize it. My life started in Kiambu County, where I followed my elder siblings to Nursery School even before attaining the school-going age ~~(gestures with his hands). Later, my~~ family migrated to Nakuru County, where my father got into large-scale wheat and barley farming.

I attended Mwangagi Primary School before joining Afraha Secondary School and later Kagumo High School. My educational journey led to a degree in Electrical Engineering from the University of Nairobi. I later pursued an MBA in Strategic Management.

Throughout my career, I also undertook various courses, especially during my time at Kenya Power and Lighting.

Frank: ***Take us through your work and how you got here.***
Pe er: After Form Six, I joined the National Youth Service for three months before joining the university. I graduated in 1990 and managed to secure employment at Kenya Polytechnic in Nairobi as an Assistant Lecturer, teaching math, physics and of course, it being a diploma institution, I was also teaching electrical engineering subjects. Some people still call me "Mwalimu." Shortly after, I joined Kenya Power as a Graduate Engineer.

Frank: ***What are your earliest career memories?*** As a Graduate Engineer, we were taken **Peter:** round all the installations of KPLC and one of the best memories is when we trained at Eastern Hydros in Matendeni for three months (mimes working with his hands). We used to carry out maintenance work and would go at night when the machines would be put off, starting from around 11.00 pm and carry out some serious work and be able to put the machines back at dawn. This might sound unreal, but you had to be there to believe it. There is nothing in the ~~world like witnessing the breathtaking~~ sunrise when leaving the generating stations underground (raises his hand to mimic the sunrise). That was just majestically beautiful! It was like God's way of rewarding us for working too hard throughout the night.

By the time I left Kenya Power, I was the General Manager, Infrastructure Development. In total, those were thirty-one years at Kenya Power.

Frank: ***What is it that made you want to join KenGen?***

Peter: I had been in management for quite some time and was inspired by KenGen's expansion in geothermal energy (eyes light up). More importantly, the experience and my attachment to the hydropower stations have always been nostalgic to me and a driving force to come to KenGen. The opportunity to contribute to a company at the forefront of geothermal generation worldwide drove me to apply and prepare for this role.

I kept on following the way KenGen was expanding in geothermal to become one of the leaders in geothermal generation in this region and even in the world. In this space, KenGen is a force to reckon with, so I put in my application and prepared myself.

Frank: ***What drives you as a person?***
What is it Coming ***that really*** from ***akes*** a competitive ***yutick?***
polygamous **Peter:** background, I find motivation in helping others (nods approvingly). When someone brings a problem to me and leaves with a smile, I feel fulfilled (smiles). Service to humanity is service to God.

At Kenya Power, most of my time was in customer service, where I dealt with many customer complaints. My happiest days were when I left the office, knowing I one had person helped smile. somebody and made even

> *'The opportunity to contribute to a company at the forefront of geothermal generation worldwide drove me to apply and prepare for this role.'*

Frank: ***I want to understand your spirituality. Are you Christian or Muslim?*** I am a devout Christian and a member **Peter:** of Faith Evangelistic Ministry (FEM) Family Church in Karen. In my church, I am part of the security team and oversee administration work as I believe in the value of serving others.

Frank: To ***What*** be successful, ***is your leadership*** I believe a ***style?*** leader must **Peter:** actively contribute to solutions (raises his index finger). I engage with the challenges and tasks at hand and work alongside my team to achieve our goals. I believe in getting my hands dirty and asking the right questions to get the most pragmatic solutions to our challenges (nods approvingly). I like it when people simplify things because it means they know what they are talking about.

PART 2: Tracing the Journey to the Top Eng. Njenga's story of Discipline, Hard Work and Ordained Leadership

Take a moment and recall the day you walked into KenGen offices for an interview – a position you probably had coveted for years! Well, congratulations on getting in. But have you ever wondered what really goes on in the interview processes of some of the highest-held offices in any career?

An application for a Medical Director for the National Referral Hospital interview. Round two interviews for the World Bank's Global Finance Director. The interview screening phase for a University Vice-Chancellor.

What questions do they ask an interviewee coming for the KenGen Managing Director and CEO position? How do you tackle a question to which you have no idea of a suitable response? How long does the interview take? What will it take to impress the Governing Board of the region's largest electric energy producer?

Should you smile or appear stern? If your career ambitions can picture these scenarios, even for a fleeting moment, then today, this story is for you.

In part two of Eng. Peter Njenga's profile interview, the man who walks in the bright light of the morning sunshine gives us a sneak peek into the interview process for one of the most coveted positions in the country.

Frank: ***What was the interview process like for you? In your wildest dreams, did you ever imagine you would become a CEO?***

Peter: While at Kenya Power, I had the privilege of acting in the position of Managing Director and CEO several times. Those few times gave me the momentum and stirred the inspiration to lead me to higher career ambitions. CEO of KenGen was, therefore, a silent, but certain dream somewhere in my horizons.

Frank: ***So, the advertisement was put out, calling for applicants to join as CEO at KenGen*** Yes, and I submitted my application!

Peter: What you might not know is that a few months earlier, Kenya Power had advertised for that position and I had applied. Unfortunately, my application did not go through because, fortunately, or unfortunately, I failed to attach some of my documents due to technical hitches. I say fortunately because if I had made it through at Kenya Power, I most likely would have missed this exciting journey at KenGen, so I say it was all God's plan. I personally and physically ensured I hand-delivered my application here even after I had sent my online application, together

'Through my leadership training at Harvard, I gained invaluable insights into effective management and leadership styles. I learned the value of having teams that are sufficiently inspired, motivated and engaged to achieve desired outcomes.'

with the attachments by email. I was not taking chances with technology this time round.

Frank: ***So how was the interview process?*** The interview was conducted in two **Peter:** sessions. I walked into the interview room on Day 1, expecting to find a panel ready for the oral interview. To my surprise, I walked into a room with nothing but a laptop. On it, a case study that I should go through in thirty minutes and be ready to make a presentation to the Board of Directors. This is where I got to thank myself for not relying on Personal Assistants and my juniors to do all my work, otherwise, I would have been stuck with PowerPoint. I cannot say it was perfect, but I had something - that and God. I did my presentation and awaited my fate. The following day, I received communication that I was among those who did well and that I had been shortlisted for the next stage, a psychometric test that would take me two good hours to complete.

Frank: ***And then you got into the next round of the interview. Tell us about that.*** Now, for the second interview, every **Peter:** Board member came in well-armed with their questions, an interview that lasted well over one hour. It was intense, but also interesting. I was fascinated by the rich mix of the Board members and their genuine intent to pick the best person for the job. I felt at home even when responding to some of the questions, which I found quite challenging. I thanked them, bid them goodbye and prayed to God that I had gotten the job.

Frank: ***Then the big announcement. On national*** The ***TV and*** first ***radio!*** reaction ***How was that?*** shock, then **Peter:** excitement, then came anxiety. For the next few days, it was a pendulum of emotions. On one hand, this was a dream come true – especially remembering all the things I had promised the Board I would do if I ever became the KenGen MD and CEO. On the other hand, I was anxious from the realization of the huge task that was ahead of me, not forgetting I was joining a totally different environment. A lot was going on.

Frank: Has anything changed? How do Peter: ***people*** Let ***look*** me ***at*** tell ***you*** you, ***at*** the ***home,*** position ***atchurch?*** of CEO for a company like KenGen is one where you are no longer yourself. You come in the morning and there are people waiting to see you. My schedule has totally changed, but I have a great team who are making my life easier. At home, my children are still very excited! Often, you will hear my daughter say, "I feel nice being the daughter of an MD and CEO!" Another significant change is that I can no longer pop in anywhere, at any time. It is funny - I promised my former colleagues at Kenya Power that I would visit them sooner, only to be told that my going back there was going to need planning and scheduling.

Frank: ***I mean, you would just be crossing over the fence... that must have been*** I thought ***your*** I ***initial*** would ***thought*** just walk. around. I **Peter:** was told no, you cannot come. You are no longer the same person. Those are some of the things that you must adapt very quickly because work has to be done. I am glad we finally did it a week later and I was able to bid my goodbyes to a team I had served with for over three decades.

Frank: ***You went to NYS. Do you think the training you received there played a role in*** One ***your*** of the ***life?*** best things that you gain in **Peter:** NYS is self-discipline. NYS moulded us into highly disciplined individuals. Kenya needs professionals who are disciplined and ready to take on the huge responsibility of running this country. We can however leave out the paramilitary aspect of the training.

Frank: ***Tell us something about your Harvard*** Through ***experience*** my leadership. training at Harvard, **Peter:** I gained invaluable insights into effective management and leadership styles. I learned the value of having teams that are sufficiently inspired, motivated and engaged to achieve desired outcomes. The beauty of that course was that it was practical, drawing from numerous case studies that showcased successful strategies that have been tried and tested by some of the best-performing companies in the world. These skills have equipped me to apply what I have learned in real world scenarios, making me confident in my ability to succeed. By all means, Harvard's training has been instrumental in my professional growth.

PART 3: Peter's Promise to Jenga KenGen, Hope Beyond Office

In this last episode, we delve into Eng. Peter Njenga's ambitious vision for the company's role in economic transformation, explore his innovative strategies for managing stakeholders and even uncover his hidden talent for cooking up a storm.

This is the grand finale. We unearth more gems from the world of energy and leadership. Get ready to discover what drives Eng. Njenga in moments of adversity, his future aspirations and the invaluable lessons he has learned along the way.

It is a journey filled with resilience, wisdom and a deep sense of purpose. So, without further ado, let us dive into Peter's captivating world as we wrap up this remarkable interview series.

Frank: ***How do you see KenGen fitting into the BETA economic transformation agenda and what is your plan for helping the government achieve*** KenGen's ***theseambition*** roleis***?***
pivotal in the BETA**Peter:** economic transformation agenda as a provider of essential electricity. To align with this transformation, we must ensure that electricity is accessible at cost-effective rates, especially for those at the bottom of the economic pyramid. Keep in mind that KenGen generates over 60% of the country's electricity, which contributes to maintaining reasonable electricity prices.

Frank: ***As we are talking about the availability of power plants, how do you intend to really marshal the people who manage our power plants on day-to-day basis to ensure high availability?*** Upon my arrival at KenGen, I noted**Per:** that certain power plants were not operating optimally for various reasons. My plan is to rectify this situation by enhancing maintenance practices, sourcing the correct spare parts and ~~incorporating the latest technologies~~ ~~into~~ our operations.

Let us collectively focus on delivering our best work. This commitment to excellence will enhance our operational efficiency, leading to increased revenues, which is the ultimate goal for us all. Let us reach for greatness, both at work and at home, that will take you close to perfection. And finally, make peace with God.

Frank: ***To do those things, you require the team, the people. We would like to hear your plans about the KenGen workforce*** **l.** believe in the importance of**Peter:** senior employees mentoring and empowering the younger generation within the company. Young professionals often bring innovative ideas that can enhance the organization's performance. I have seen the success of this approach in my previous role at Kenya Power, where a young engineer I mentored became a driving force behind the smart meter agenda. To promote generational balance, I am actively working with management to ensure young professionals have a significant presence at conferences and seminars.

Frank: ***Let us talk about stakeholder management, which I know is a significant part of your job. How do you see managing the KenGen stakeholders, given that there are high expectations from a wide array of our stakeholders, including the government, communities, suppliers and prospective*** Effectivestakeholder***emplyees?*** management is**Peter:** atthe core of KenGen's strategy. We recognize the diverse expectations of various stakeholders, including the government, communities, suppliers and prospective employees. My plan is to prioritize transparency, maintain active engagement and align our activities with national goals. We aim to actively involve our stakeholders, invest in community development, foster strong relationships with our suppliers and provide opportunities for talent development. By balancing these interests, we can ensure that KenGen remains a reliable, sustainable energy provider, while meeting the expectations of our diverse stakeholders.

Frank: ***Now, there has been this debt that KenGen has with Kenya Power, approximately 25 billion. There are people who believe that you know which buttons to press. Is this finally the time we will see that figure going down?*** I am optimistic about the reduction of**Peter:** this debt. Kenya Power recently implemented a new tariff structure, leading to improved revenue generation. The tariff review took into consideration the needs of all sector players, including KenGen, which is Kenya's largest electricity generator. Consequently, we have observed that payments are being made, including additional payment to clear the arrears. This positive trend indicates that the debt figure may indeed

decrease.

Frank: ***Looking at all the Agencies in the energy sector in Kenya, what is the one thing that sets KenGen apart from the rest?***During my brief time at KenGen, I have**Petr:**been impressed by the high level of professionalism among our employees. With some refinement and improvement, I believe KenGen has the potential to perform even better.

Frank: ***During your tenure here, what is the one thing you really must achieve?***My primary goal is to ensure the optimum**Peer:** generation of electricity in our power plants.

Frank: ***The high cost of living is a concern for many Kenyans. What advice would you give to KenGen employees on managing their finances?***Coping with the high cost of living can**Peter:**be challenging. My advice is to live within your means and manage your finances wisely. It is important to make the most of what you have while working towards a more secure financial future.

Frank: ***What would you tell retail investors regarding KenGen's share price, especially those who bought shares at around 20 shillings and are now seeing***First,***it at***it ***two***is important***shillings?*** to note that**Peter:**I am one of those KenGen retail shareholders. My association with KenGen goes back several years. To improve our share value, the key is to enhance our business performance, which is one thing we are committed to doing.

Frank: ***While presenting his vision to the Parliamentary Vetting Committee, Energy and Petroleum Cabinet Secretary, Davis Chirchir said he would like to see power installation host communities connected to the grid. How do you plan to deliver this promise?***That is a good question. I believe we**Pter:**can leverage the new Energy Act, which now allows us to supply electricity directly from generation to consumers. We can take advantage of this opportunity, just as we will in our Green Energy Park. The local communities are our partners in power generation and I will be happy when we see the villages surrounding our installation connected to the national grid.

Eve: ***CEOs are perceived to be the happiest***Interesting***people.Are***question***youhappy?***.Well, I am a content**Peter:** and happy individual. My family is thriving and I have the privilege of representing a renowned brand like KenGen, which holds the promise of a brighter future for all Kenyans and also makes a positive impact, not only in Kenya, but in the world. What more could a man ask for?

Eve: ***I am sure your parents would be proud of***My***who***late***you***father,***ave***may***become,***hissoul***right?***rest in**Peter:**peace, would undoubtedly be proud. When I was appointed as KenGen Managing Director and CEO, my mother was overwhelmed with joy and her pride in me continued.

Eve: ***Have you made any mistakes along the way? Have you learned lessons and things you wish you could*** Peter:***change?***Nobody is without imperfections. One aspect I wish I could alter is the time spent with my children when they were younger. It is often challenging to balance career and family. Perhaps a comprehensive study is needed to determine the best approach for achieving this balance.

Eve: ***You have had to make tough decisions at some point. In moments of adversity, where do you draw your resilience***Making***orstrength***challenging***from?*** decisions often**Peter:** requires quick thinking. My motivation comes from knowing that the choices I make are ultimately for the greater good of society.

Eve: ***Are you currently reading any*** Peter:***books?***My favourite book is the Bible. I also love reading short stories, articles and novels. I seem not to have the patience for voluminous books unlike my wife, who is a very good consumer of books. I envy her passion for reading and she does it effortlessly, even when busy with other things.

Eve: ***Do you think women are better at multitasking?***Ifirmly believe that women excel at**Peter:**multitasking. They can handle multiple responsibilities, manage households, make tough decisions and pursue their careers effectively. Women are, in many ways, like superheroes. I have experienced this first-hand in my house.

Eve: ***What is something that people may not know***have ***about***apassion***you?*** for cooking, swimming**Peter:** and cycling. I recently enjoyed a refreshing swim at our Geothermal Spa. By the way, did you know you can make ugali in a pressure cooker? My favourite dish to cook is matumbo.

Eve: ***Can you paint a picture of the day you will hang your coat as KenGen CEO?*** After my time as KenGen CEO, I**Pet**envision**r:** contributing to society in various roles, such as serving on boards, providing consultancy in project management and dedicating more time to mentor and nurture young talent.

Eve: ***Your parting message to KenGen employees?***Let us collectively focus on**Peter:**delivering our best work. This commitment to excellence will enhance our operational efficiency, leading to increased revenues, which is the ultimate goal for us all. Let us reach for greatness, both at work and at home, that will take you close to perfection. And finally, make peace with God.

Energy Cooperation

Eastern Africa Power Pool Considers Opening Its Doors to Private Energy Players in the Region to boost Energy Access

By Emmanuel Wandera, Assistant Manager External Communication and Media Relations

The East African Power pool steering committee members and council of ministers present for the 30th Steering Committee meeting to discuss regional colaboration and advancing sustainable energy solutions and power trade across Eastern Africa.

In February 2024, the Eastern Africa Power Pool Steering Committee members and Council of Ministers convened in Nairobi at the Ole Sereni Hotel for their 30th Steering Committee and 18th Council of Ministers meeting to discuss regional collaboration and advancing sustainable energy solutions and power trade across Eastern Africa.

The meeting discussed key among other things how to strengthen the organizational structure of EAPP with a view to enhancing coordination, streamlining decision making processes and to fortify the EAPP's capacity to address emerging challenges head on. Coming at a time when the EAPP is discussing the option admitting independent power producers and independent transmission developers

We are sourcing partnerships and financing for projects in solar and hydropower for a greener and more cost-effective energy future


EASTERN AFRICA POWER PO
EAPP
30TH SC & 18TH COM MEETING
MINISTRY OF ENERGY
AND PETROLEUM
KBC
tv47

to be part of the Eastern Africa Power Pool. Currently EAPP has thirteen (13) member countries that have signed the Inter-Governmental Memorandum of Understanding (IGMOU), as well as fourteen utilities who have signed the Inter Utility Memorandum of Understanding (IUMOU).

The introduction of independent energy players in EAPP is a game changer as it will catapult EAPP's objective to enhance energy security, promote sustainable development, and foster collaboration and trade in the power sector to the next level as the region will enjoy both the strength of Governments and private players in advancing sustainable energy solutions and power trade across Eastern Africa.

Speaking during the meeting the EAPP Secretary General Eng. James K. Wahogo called for partnership as the key towards developing and deploying renewable energy in the region to meeting the region's growing energy demand.

Acknowledging the importance of bringing together all energy players both private and public and development partners Minister Chirchir welcomed the discussions on admitting independent power producers and independent transmission developers to be part of the Eastern Africa Power Pool because they hold a considerable market share in the region's power pool and play a critical role in the region's energy sector.

"We are actively promoting the harnessing of renewable energy sources to meet the region's power demands sustainably. "We are sourcing partnerships and financing for projects in solar and hydropower for a greener and more cost-effective energy future," said Eng Wahogo through a press statement.

The same sentiment was reiterated by Kenya's Cabinet Secretary Ministry of Energy and Petroleum Davis Chichir who was the host for EAPP meeting and the Chairperson Council of Ministers Hon. Sidronius Okaasai Opolot, and Minister of State for Energy Uganda while addressing the media.

"Africa is now experiencing a new frontier of industrialization and economic growth, and this calls for a robust energy revolution to match the current and future demand. However, almost 600 million of the 1.5 billion people in Africa do not have access to electricity, with a bigger number being served by unclean sources. This

scenario calls for regional partnerships to address the dynamic energy landscape in Africa for the good of our citizens," said Minister Chirchir

Acknowledging the importance of bringing together all energy players both private and public and development partners Minister Chirchir welcomed the discussions on admitting independent power producers and independent transmission developers to be part of the Eastern Africa Power Pool because they hold a considerable market share in the region's power pool and play a critical role in the region's energy sector.

"Admitting independent power producers and independent transmission developers to be part of the East African Power Pool. Noting that such private players hold a considerable energy market share in the region, we cannot afford to leave them behind in the regional power integration program," said Minister Chirchir

"Even though the discussion is still ongoing, the Eastern Africa Power Pool will update members on the resolutions of Admitting Independent Power Producers and Independent Transmission Developers to be part of the East African Power Pool once they concluded," said Hon. Sidronius Okaasai Opolot, Chairperson Council of Ministers and Minister of State for Energy Uganda.

The Eastern Africa Power Pool has realized many achievements including ongoing efforts to enhance the interconnection of national power grids which is progressing well, contributing to increased efficiency in power exchange and supporting economic development across member countries.

"To build on the benefits of this interconnectivity, we are striving to have the competitive day-ahead power market go live by the end of December 2024. This market will take us from bilateral trade to trade amongst countries all countries in the region, ensuring not only regular supply but efficient use of energy," added Eng Wahogo.

Eastern Africa Power Pool Nairobi meeting was attended by representations from members states along with key development partners like the World Bank, the African Development Bank (AFDB), USAID / Power Africa and utilities in the Eastern Africa Region actively participating in the meetings reflecting a shared commitment to advancing regional cooperation in the energy sector.

Companies like KenGen are at the forefront of driving the deployment of renewable energy, boasting over 86% renewable energy share, making Kenya a leader in the region in combating the effects of climate change

Road to COP28:

Defining Africa's Path to a Sustainable Future

By Eng. Peter Njenga, Managing Director and CEO - KenGen PLC

The planet is facing an urgent climate crisis and we find ourselves at crossroads where immediate action is not just a choice, but a necessity. The recently concluded Africa Climate Summit 2023 in Nairobi, along with the upcoming COP28 conference in the UAE, provide a beacon of hope and a clear direction for the African continent.

These pivotal events underscore the pressing need to decarbonize our energy sector and set the stage for a greener and more sustainable future. A turning point in our global commitment to address climate change was marked at COP27 in Sharm el-Sheikh, Egypt last year. The decisions taken there sent a resounding call to all nations to intensify their efforts in combating the climate crisis.

A significant breakthrough was the establishment of a dedicated fund for loss and damage, recognizing the vital support needed by vulnerable countries affected by climate disasters. This fund and its funding mechanism will be instrumental in aiding those who bear the brunt of climate change impact. Furthermore, maintaining our focus on limiting global warming to 1.5°C is imperative as emphasized by the UN Intergovernmental Panel on Climate Change (IPCC), which has set stringent deadlines to peak global GreenHouse Gas (GHG) emissions before 2025 and reduce them by 43% by 2030. These ambitious targets are fundamental for ensuring a sustainable future.

Accountability for commitments made by various sectors, businesses and institutions is equally crucial as we transition into the implementation phase, ensuring that all aspects of human activity align with the 1.5°C goal. Additionally, mobilizing financial support for developing countries is essential, redirecting financial flows toward low-emission and climate-resilient development as initiated during COP27.

This is why the Africa Climate Summit 2023 was a significant moment for our continent. The summit resulted in the Nairobi Declaration, which urgently called for global action on climate change. African leaders reiterated the disproportionate burdens and risks African countries face due to climate change. The summit also highlighted Africa's potential for green growth, with an impressive $23 billion pledged to green projects by governments, investors, development banks and philanthropists.

Notably, the United Arab Emirates pledged $4.5 billion to clean energy initiatives in Africa, with the potential to generate 15 gigawatts of clean energy by 2030. Germany and the United States also made substantial climate finance commitment,

The summit resulted in the Nairobi Declaration, which urgently called for global action on climate change. African leaders reiterated the disproportionate burdens and risks African countries face due to climate change.

KenGen is accelerating clean technology innovation and deployment and has made significant impacts in climate action and the greening of economies nationally and internationally

reinforcing Africa's resolve to combat climate change. The Nairobi Declaration's call for global carbon pollution taxes, coal phase-out and ending fossil fuel subsidies underscores Africa's determination to lead in the fight against climate change.

Decarbonizing the energy sector is central to our efforts. Kenya has made commendable progress in this regard, with a commitment to renewable energy. Our geothermal, wind and solar energy projects serve as scalable examples. We are also exploring new opportunities in hydropower, biomass and small-scale solar installations. By diversifying our energy sources, we can ensure a stable and sustainable power supply for our growing economy. Looking ahead, we must continue to invest in clean energy sources, enhance energy efficiency and foster innovation to achieve our decarbonization goals.

While Kenya's efforts are commendable, the broader African continent has a pivotal role to play in the global energy transition. Africa is blessed with abundant renewable energy resources, including solar, wind, hydro and geothermal potential. These resources can not only meet the continent's energy needs, but also make a substantial contribution to global climate action efforts.

Africa's vast deserts and sunny climate make it a potential solar energy hub, with investments in large-scale solar projects offering clean and affordable electricity, while reducing reliance on fossil fuels. In the same way, the continent's extensive coastlines and open landscapes provide ideal conditions for wind power.

Companies like KenGen are at the forefront of driving the deployment of renewable energy, boasting over 86% renewable energy share, making Kenya a leader in the region in combating the effects of climate change. Notably, hydropower, already well-established in countries like Ethiopia and Zambia remains a reliable and sustainable energy source that should be maintained and expanded across the continent. Additionally, geothermal energy, exemplified by KenGen's exploits in Olkaria, Naivasha, represents an underutilized resource in many African countries, necessitating government investments in exploration and development to fully harness this clean and renewable energy source.

As we prepare for, Africa finds itself in a unique position. UAE, which has pledged substantial investments in clean energy projects across Africa, hosted the pivotal COP28 conference in Dubai, presenting a remarkable opportunity for African nations to showcase their commitment to sustainable development and secure further support for their clean energy initiatives.

African nations must collaborate closely with global partners to ensure that climate resilience investments translate into tangible projects that benefit our people and the planet. COP28 provided a platform for Africa to advocate for global climate finance mechanisms that prioritize the needs of developing nations.

COP28 presented an opportunity for Africa to emphasize the importance of technology transfer and capacity building. Access to clean energy technology and knowledge sharing are essential for our continent to accelerate its energy transition. The continent's journey toward a sustainable and decarbonized energy sector is well underway, with Kenya leading by example. The Africa Climate Summit 2023 and COP27 resolutions have set the stage for meaningful action, and COP28 in Dubai offered a unique opportunity to showcase our commitment to a greener future.

Masinga Dam Not Posing Floods Threat

By Kenedy Wambua - Writer Embu County

Masinga Hydro Power Station is an embankment on Tana River, the longest river in Kenya and is on the border of Embu and Machakos Counties in the Eastern Region. It was constructed in 1981, with an estimated value of 1 billion Kenya shillings, producing 826MW of electricity.

According to Kenya Electricity Generating Company (KenGen), Masinga Power Plant is the largest reservoir in the cascade and has an additional spillway to avoid floods when the water levels rise past the full supply level.

Masinga Power Station has two installed units, with a reservoir capacity of 1560 million cubic metres and uses two Kaplan turbines with 20MW each. The dam also gets water from Chania, Gura, and Mathioya Rivers.

Masinga Power Station has two installed units, with a reservoir capacity of 1560 million cubic metres and uses two Kaplan turbines with 20MW each.

In February 2018, KenGen revived plans to raise Masinga Dam wall by two (2) meters and installed pumping equipment to recycle the downstream water discharge back to the dam for steady electricity output.

At a media and networking engagement held recently, Marketing and Corporate Communication Manager, Frank Ochieng noted that the water levels in the dam are currently not posing any threat of floods since the water has not reached full capacity level. He urged Kenyans to continue with the tree planting exercise launched by the President as it would help solve the issue of climate change that has led to the low levels of water in the dam.

Assistant Manager, Power Generation – Eastern, Eng. Isaac Tarus noted that when Masinga is on full supply, water rises to 1056.5 meters above sea level then it spills. He added that the current water level in the dam is 1042.67, which is way below the spill level, giving a head room of 13 meters.

“The water inflow from Tana River is 200 cubic meters per second and the level is rising steadily and it is acting as a storage capacity. The dam can store up to 1.56 million cubic meters and at the moment, for water to fill the dam up to the water spill level, it will take four (4) months,” said

"The water inflow from Tana River is 200 cubic meters per second and the level is rising steadily and it is acting as a storage capacity. The dam can store up to 1.56 million cubic meters and at the moment, for water to fill the dam up to the water spill level, it will take four (4) months,"

Light in the village

By Ahmed A. Godana

From the sleepy, dark village to a lit, vibrant village. Services like refrigeration for perishable goods, cold drinks, mechanical workshops - "jua-kali" and phone charging station outlets, are all available.

Eng. Tarus.

From generation, transmission, to distribution of electric power, all in order to connect Kenyans to this vital commodity, electricity, Balesa village in North Horr Constituency was a sleepy, dark village at night, with no hope to get connected, until Rural Electrification and Renewable Energy Corporation (REREC), then REA team visited in 2017. The only lighting was from solar panels for the few businesses and torches powered by batteries for the large population.

After a courtesy call at the local Chief's office, the team disclosed the good news about the Solar Mini-grid Power Station. The locals who had just been connected to the world through Safaricom telecommunication network earlier that year, did not believe in their wildest imagination that they would have an electricity power station at their village. They received the news with mixed reactions, some yet to grasp it, thinking it was a joke. After surveying the site and holding a public baraza, the good team left.

Months later, the contractor arrived. It was the talk of the town. Great news indeed. Truly, light at the end of the tunnel. The construction works went on smoothly and the little village, their two local primary schools and Dispensary lit up.

From the solar panels at the station, inverters and batteries in their control room to electric lines on poles, dropped to locals' houses, electricity is home. Generation, transmission and distribution, all in one. From the sleepy, dark village to a lit, vibrant village. Services like refrigeration for perishable goods, cold drinks, mechanical workshops - "jua-kali" and phone charging station outlets, are all available.

I remember driving to nearby town of North Horr (a distance of about 100kms round-trip) just to do welding and still risk the poor rough, murram road to undo the welded spots.

The locals now hardly recall the old dark days with torches and "eveready" batteries. The village is on upward trajectory to being a town.

Last-mile connectivity is real.

The writer is a local of Balesa village. Graduate of Bachelor degree in Accounting.

Ahmedhajj47@gmail.com

Why Retirement of Thermal Plants
is not the Best Solution

By Anthony Kahindi Kenga – Oil and Gas Technologist

Retired Kipevu area two thermal plants located in Mombasa County. The area had an installed capacity of 193.5 MW

Kenya relies on a mix of energy sources to meet its electricity demand, including hydro, geothermal, wind, solar and thermal. However, thermal power generation, which uses diesel or heavy fuel oil is the most expensive and polluting source of energy.

According to Kenya Power, thermal power accounted for 10% of the energy mix in the financial year 2021/22, down from 15% the previous year. The utility said it aims to reduce the thermal power share to below 5% by 2023/24.

The recent retirement of KenGen's Kipevu I is affecting the coastal region with incessant power outages. We are now bearing the brunt of retirement amidst better solutions in the current world. Though the move is intended to save the environment, an alternative option ought to have been hatched to save us from this mayhem.

Our country's effective power capacity is around 3,040MW. Subtracting 10% for maintenance purposes leaves around 2,736MW. Subtracting around 24% for system losses, we remain with approximately 2,080MW. 1% then goes off as Auxiliaries consumption, leaving around 2,060MW.

The reality is, our peak demand in Kenya is 2177MW against a possible 2,060MW. Out of this, more than 300MW is wind power, which is mostly unavailable during peak periods.

Ironically, Kenya is suffering while Tanzania is estimated to have a large reserve of confirmed offshore natural gas deposits, which, if well developed, could have significant macroeconomic implications for both nations. We need to emulate them as they use either natural gas or sometimes liquefied petroleum gases in place of natural gas majorly in electricity generation. This can be achieved through signing a bilateral agreement, leading to the construction of a natural gas pipeline to the Kenyan coast that will go a long way in boosting energy security and economic growth in both countries. Recently, Uganda our good neighbor inked a similar deal. Why not us?

There are a total of nine thermal power plants in Tanzania converting natural gas to electricity: Ubungo I and II, Tegeta, Songas, Mtwara, Somanga, Kinyerezi I, and II, and Dangote. Total production per year stands at approximately 650MW. The biggest plant, Songas Project, is currently producing around 200MW of electricity using natural gas.

Kenya must rethink the move. It is becoming more expensive than expected. We will be forced to import higher than the projected 400MW if we do not rethink our power planning strategy.

De-risking Renewable Energy Generation

Saurabh Sharma, Director, Emerging Customer - Britam Holdings Plc.

At the recent Africa Climate Summit, Kenya articulated an ambitious goal of meeting 100% of its energy needs through renewable sources by 2030. This drive to address the issue of power generation as a key aspect in the achievement of carbon neutrality has solidified Kenya's leadership in the global green energy transition. Kenya's clear articulation of its vision serves as an inspiration to other nations in Africa and beyond.

As of 2023, Kenya already generates approximately 90% of power from renewable sources, with geothermal, wind, solar and hydropower playing significant roles (Economic Intelligence Unit, 2023). In addition to these established sources, the nation is also exploring the potential of other technologies such as green hydrogen and nuclear energy generation to further diversify its energy portfolio.

'The World Bank projections suggest that Kenya could suffer a loss of up to 7.25% of its economic output by 2050 if robust measures are not taken to adapt to and mitigate the effects of climate change.'

While a focus on new power generation is key, ensuring management of adequate baseload power, while shoring up and expanding transmission and distribution infrastructure will also be important in ensuring the success of a transition to 100% renewable energy generation.

According to a World Bank report, realizing a carbon-free electricity energy system by 2030 demands investments of up to $2.7 billion, with the assurance of long-term cost-effectiveness as fossil fuel costs decline. A power system which is wholly dependent on renewable energy sources will therefore require the country to manage both technical and financial consideration.

An emerging area of concern which could impede Kenya's progress on the path to 100% renewable generation relates to adverse climatic conditions. Insurance

The renewable resource risk can be mitigated by designing an appropriate parametric insurance product that measures a relevant index. For instance, rainfall or reservoir level can be a parameter for hydropower and if the measurements fall below critical level, an insurance payout can be triggered to cover the loss of revenue.

could play a vital role in managing these risks.

The Threat of Climate Change

Climate change is contributing to increasingly unpredictable weather patterns and extreme weather events across the globe. The risks associated with climate change present a formidable challenge to Kenya's social and economic development. The World Bank projections suggest that Kenya could suffer a loss of up to 7.25% of its economic output by 2050 if robust measures are not taken to adapt to and mitigate the effects of climate change. These effects are anticipated to escalate due to rising temperatures, increased rainfall uncertainty, and more severe dry spells.

USAID further predicts a temperature increase of 1.2 to 2.2 degrees and a rise in sea levels of 16-42 cm by 2050 (USAID East Africa Climate Risk Profile, 2020). While these changes will impact the entire economy, sectors such as agriculture, biodiversity, water resources and energy infrastructure are particularly vulnerable. The impact on energy generation is already evident. Drought conditions have resulted in a significant reduction in hydropower production. The decrease in dam levels necessitated a shift to costlier and more pollution-heavy thermal power generation to meet the energy gap. On the other hand, heavy rainfall can cause dams to overflow, leading to devastating loss of life and livelihoods.

As climate change-induced variability in weather patterns is expected to increase, the ramifications for renewable energy sources, water, wind and sun are likely to worsen.

The Role of Climate Insurance

In this scenario, climate insurance emerges as a crucial tool. Climate insurance products can help to mitigate the financial effects of extreme weather events, including floods and droughts. Climate insurance is a versatile tool which allows bespoke products to be designed and applied across diverse sectors such as agriculture, water resources and infrastructure and at national, sub-national, business, or household levels.

Most climate insurance products operate on parametric principles, tying claim payouts to key parameters like rainfall, wind speed, or river levels. The advantages of parametric insurance include simplicity, objectivity, operational efficiency and timely payouts facilitated by remote measurement using technological tools such as satellite images or river gauges.

Climate Insurance and Renewable Energy Resource Ris

Parametric insurance can effectively de-risk renewable energy projects by mitigating potential revenue losses stemming from a lack of natural resources such as wind or water. This approach is applicable to the entire spectrum of renewable resources, offering coverage against insufficient rainfall, low solar irradiation, or wind speed.

Therefore, in addition to providing loss protection for extreme weather events and damage or destruction of the infrastructure, insurance can also be applied towards stabilizing project cash-flows, with insurance payouts compensating for a drop in revenue resulting from insufficiency of renewable resources.

The renewable resource risk can be mitigated by designing an appropriate parametric insurance product that measures a relevant index. For instance, rainfall or reservoir level can be a parameter for hydropower and if the measurements fall below critical level, an insurance payout can be triggered to cover the loss of revenue. This increased revenue protection can enhance the attractiveness of these projects for investors and lenders, and potentially also reduce the cost of capital. Both new and existing projects stand to benefit.

Kenya is making commendable progress toward its green energy transition goals, but the looming threat of adverse climatic conditions necessitates proactive measures. The incorporation of climate insurance as one of a range of tools into long-term strategies is a prudent step, offering a means to safeguard against climatic uncertainties and enhance project viability, providing a boost to the sector.

CS Davis Chirchir's
Masinga Visit

By Kenedy Wambua, Writer Embu County

Kenyans should expect lower power bills from next month going forward says Energy and Petroleum Cabinet Secretary Davis Chirchir.

Speaking during a press briefing at Masinga dam in November, after assessing the water levels, Chirchir assured Kenyans that KenGen would produce more power at the 7 Forks to beat the power shortage witnessed in the country due to low levels of water in the dams.

The Cabinet Secretary further called on those living downstream to be on high alert and exercise caution and urged those close to the river to consider moving to safer grounds to avert loss of life and minimize destruction of property.

"We are witnessing an increase in water levels, which, while short of the maximum capacity, are sufficient to enable a substantial increase in our hydropower generation capabilities," said Chirchir.
The high-water inflows are particularly being experienced in the Kamburu dam which, other than River Tana inflows also receives water from the Thiba River.

'the Ministry of Energy has set several measures to ensure the stability and efficiency of power, including optimization of water usage in all dams to maximize hydropower output'

Kamburu dam for instance is at 1,005.82 meters above sea level against a maximum capacity of 1,006.50, which means that it will reach the maximum levels over the weekend or early December, should the rains persist.

As for Masinga dam which is the largest dam in the cascade, the levels are slightly lower, giving it some headroom of about nine metres to reach the maximum capacity.

Chirchir further noted that the Ministry of Energy has set several measures to ensure the stability and efficiency of power, including optimization of water usage in all dams to maximize hydropower output while preventing spillage, wastage and bolstering the grid infrastructure to handle increased power supply, ensuring that this benefit translates to reliable energy for all Kenyans, even in remote locations.

According to KenGen Managing Director and CEO, Eng. Peter Njenga, the company is upping generation activities in the lower dams notably, Kamburu, Gitaru, Kindaruma and Kiambere to ensure they optimize the increasing levels of water they are getting and at the same time, giving Kenyans reprieve in the form of cheaper power.

Present was the Permanent Secretary, State Department for Energy, Alex Wachira, leaders from the administration department, KenGen officials and MP for Garissa Township, Hon. Dekow Mohamed Barrow, who confirmed that Garissa town

Kenya In Need of More Women in the Energy Sector

By Poshia Musesya

is flooded and is the leading County in the effects of flooding.

Kenya's national development blueprint, Vision 2030, recognizes energy as a key enabler in the fight against poverty and a catalyst for the SDGs. As the world shifts to greener and more sustainable energy sources, fewer women are involved in the sector's management and policymaking levels. Gender disparities in the energy sector continue to be a significant barrier to equal employment opportunities for women in the sector.

Climate change remains one of the most monumental challenges of our time, threatening the lives, livelihoods and health of women and girls all over the world. As the world calls for greater action to combat the devastating effects of climate change, the number of women in technical positions in the energy sector is decreasing by the minute. According to the Kenya Industrial Research and Development Institute (KIRDI), women make up only 5% of technical staff in Kenya's renewable energy sector.

But why are there so few women in the energy industry? To answer this question, an in-depth look at the factors influencing women's employment in this sector is required. Enrolling more women in engineering and STEM courses is one area that requires the sector's attention. Because the sector favours engineering and STEM courses, it is critical to encourage women, beginning in high schools, to pursue STEM courses, which have traditionally been dominated by men. According to a UNESCO study, only one-third of female students in Kenya's higher education pursue STEM courses.

According to research, women are more likely to support climate action and sustainability, as well as prioritize greener energy sources, particularly for home use.

Because fewer women than men pursue engineering programs specializing in the energy sector, more men are promoted to decision-making positions in this sector, leaving very few opportunities for women. As a result, addressing this issue from the beginning of education will be significant in ensuring that more women are appointed to management and technical positions.

More women in positions of leadership in the energy sector will benefit Kenya's climate action. According to research, women are more likely to support climate action and sustainability, as well as prioritize greener energy sources, particularly for home use.

KenGen's Pink Energy platform, which promotes gender equality and women's empowerment has been a trailblazer in advocating for female leaders in the energy sector. KenGen has also played an important role in advancing the space of women in C-Suite positions by hiring women in top leadership, former CEO, Rebecca Miano serving as an example. The Pink Energy Initiative has gone a long way in creating change and enhancing the potential of women in KenGen. It is founded on three key principles: personal development and empowerment, creating a conducive work environment, and creating gender awareness.

As Kenya embarks on an ambitious journey to achieve 100% clean energy by 2030, there is an urgent need to involve more women in energy decision-making. Kenya has proven to be a driving force in advancement of the sustainable and green energy debate, hosting world-class conferences such as the Africa Energy Forum and the recently concluded Africa Climate Summit. As the world prepares for COP28 and other global energy events, more and more women must be involved in this sector. Increasing the number of women at the top in the energy sector is about more than just equality. It is about electing leaders who prioritize a fair and sustainable future for all.

Poshia Syindu Musesya is a Communications

ISO Triad = Energizing Excellence

By Evelyn Wanyoike, Safety Officer – KenGen Olkaria

and Project Management professional.

In the realm where energy sparks ignite,
Three ISO stars emerge in their light.
9001, 14001 and 45001, they stand,
Guiding an energy company's hand.

ISO 9001, a quality quest,
Efficiency blooms, at its behest.
Processes streamlined, smooth and fine,
In energy's dance, they intertwine.

14001, an environmental ode,
Green practices pave a sustainable road.
Reducing waste, nature's embrace,
Energy blooms with a greener face.

45001 joins, a safety song,
Protecting workers, where they belong.
Health and safety, a paramount decree,
In energy's domain, it sets workers free.

Together they weave, a tapestry grand,
In energy's world, hand in hand.
Efficiency, sustainability and worker care,
In harmony, they take a shared dare.

Reducing risks, improving flow,
These standards help the company grow.
Certified excellence, their guiding light,
In energy's story, a beacon bright.

ISO trio, a synergy profound,
In an energy generation surround.
Quality, green, and safety's embrace,
They lead the way, in every space.

Let us celebrate, these ISO gems,
Guiding energy's brightest stems.
In their embrace, success will thrive,

Empowering Kenyan Villages:

A Focus on Household Energy Solutions

By Hydeen Ghacharia Omare, Technician, Mechanical – Kiambere Power Station

Accessibility and sustainability of energy are pivotal factors in enhancing the quality of life for individuals residing in rural areas in Kenya. Numerous villages grapple with challenges in obtaining reliable and affordable energy. Reflecting on our childhood as a villager, I could not fathom the possibility of accessing electricity one day.

Kenyan villages often face the obstacle of limited access to the national power grid. The absence of dependable electricity has far-reaching consequences, impacting various aspects of daily life, from education to healthcare. Traditional energy sources like kerosene lamps and open fires pose health hazards and contribute to deforestation and environmental degradation.

In recent years, Kenya has commendably promoted renewable energy sources, especially in rural areas. Solar power has emerged as a transformative solution, providing clean and sustainable energy for households. Initiatives such as installing solar home systems have significantly improved energy access for villagers, offering a reliable source for lighting and small electronic appliances.

Reliable energy access directly influences education in rural areas. Many students face challenges studying after sunset due to lack of electricity. The introduction of solar-powered lighting in households enables students to extend their study hours, positively influencing academic performance.

The provision of energy to rural areas has had a notable impact on the security. In the past, incidents of cattle theft were widespread in our community, but the introduction of security lights has led to a substantial decrease in theft.

Traditional cooking methods involving open fires and kerosene stoves contribute to indoor air pollution, leading to respiratory issues. Clean energy solutions, such as biogas and improved cookstoves not only reduce indoor pollution, but also contribute to sustainable waste management in villages.

Energy access fosters economic development in rural communities. With reliable power, small businesses can thrive, creating employment opportunities and contributing to the overall economic growth of the village. Additionally, the use of renewable energy sources can reduce long-term household expenses as they are often more cost-effective than traditional alternatives.

Implementing sustainable energy solutions requires community engagement and awareness. Educating villagers about the benefits of renewable energy and providing training on the maintenance of solar systems and other technologies are crucial aspects of ensuring the longevity of such initiatives.

The provision of energy to rural areas has had a notable impact on the security. In the past, incidents of cattle theft were widespread in our community, but the introduction of security lights has led to a substantial decrease in theft.

Addressing energy challenges in Kenyan villages is a multifaceted endeavour that involves implementing renewable energy solutions and fostering community engagement. By focusing on household energy solutions, we can significantly improve the lives of individuals in rural areas, promoting education, health and economic empowerment. The journey toward sustainable energy in Kenyan villages is not only about bringing light to homes, but also igniting a brighter future for entire communities.

#KenGen
- Energy for the Nation, Igniting the Future.

36 Years of Craftmanship:

The Story of Masinga Power Station's Veteran, Ndwiga

By Sulea Murambi, Principal Officer - Communication

What were you up to in 1987? Were you just entering the world, attending pre-school, primary, high school, or college? Perhaps you were already in the workforce. For Alvan Ndwiga, 1987 marked the beginning of his career at Masinga Power Station. Now, after thirty-six (36) years, he is on the verge of retiring, calling it a day.

Ndwiga has poured his dedication into Masinga, navigating through countless droughts and floods. Like the seasoned wise, he senses seasonal shifts, intimately connected to the dam for over three decades. His assessment of the dam's capacity is backed by years of firsthand tacit experience.

"You should have come here when the dam is full and water is spilling. It is spectacular! I see people driving from very far to just come and witness," noted Ndwiga as we started off our interview. His opening statement got me thinking… local tourism…revenue diversification… Inua mapato, but for now, let us focus on the tale of a man who has dedicated an unparalleled 36 years of service to the great Masinga, to KenGen.

"I will come back again. I am only eight months old in the company," I tell him and he laughs out loud. He was probably trying to recall his first year of employment.

Ndwiga started by taking me through his career journey. "I got employed when I was 23 years old and immediately after, I was taken to the Kenya Power Training School. Since then, I have remained dedicated to this station, never venturing elsewhere," he confides.

"I started working in January and by July, I was married," he chuckles. I could not help but burst into laughter at the unexpected twist.

"I have observed transformation within the company, particularly during the transition from Kenya Power to KenGen. Initially, there was fear of job losses and

"I have mentored many in the mechanical section and even as I take a bow, I know that the efficiency that has lived in this station will continue for generations to come.

we prayed earnestly. Rumors circulated and that year, a severe drought added to the uncertainties. However, the move to KenGen proved to be a turning point and life improved," reminisces Ndwiga.

Over the years, Ndwiga reflects on how work exposure has honed his skills. The company has steadily progressed, especially with the introduction of SCADA technology, propelling it to new levels.

"We used to practically spend nights at the Power Station, troubleshooting technical or mechanical issues for days on end. Leaving the station for even two days was out of the question. We ended up accumulating leave days due to constant fear of machine failure. Although technology has now simplified our work, those initial fears were very real," he recounts.

Ndwiga goes on to share anecdotes about how some of his colleagues were assigned to Sondu Miriu Power Station during its inception.

For Ndwiga, the embrace of technology stands out as the pinnacle of his career. His face lights up as he elaborates how the seamless operation and maintenance of the power station has been achieved through the integration of technology.

I inquired about his most challenging moments and as I suspected, he pointed to the stressful periods of drought. He recounted instances when dam levels dropped, leading to a halt in generation. He continued, explaining that during dry months, the team took advantage of the downtime to do plant maintenance. "Just like life, there are ups and downs," he chuckled.

As the interview progressed, my curiosity grew about how this dedicated gentleman managed to consistently show up at the same workstation for thirty-six (36) years. This can never be understood by the Millennials, Generation Z and worse off, Generation Alpha not in a million years.

"Frankly, I don't have a secret. I have simply loved my job, remained patient and found satisfaction in what I do. Life is not complicated, it is us who complicate it," he responded– with a distant thoughtful smile.

"I peep at other companies and compare what they have with what I get here and I can assure you that KenGen takes excellent care of its employees. Employee welfare is KenGen's priority number one," he emphasized. This sank in well.

So this man is leaving KenGen in February 2024. Has he transferred 'our' trade secrets to someone else? I think out loud and he smiles and says he has been working and training a generation that is equally up to the task.

"I have mentored many in the mechanical section and even as I take a bow, I know that the efficiency that has lived in this station will continue for generations to come. I keep checking and smile because my mentees do a better job than me. They sometimes tell me to sit back as they take up the assignments on their own," he tried to assure me as though reading my silent doubts.

Being the man who does not let details seep through unchecked, Ndwiga called one of his mentees to the interview, Gilbert Tanui, a Mechanical Technician. Tanui brightened up - you know that proud father-son moment? That moment of assurance that the family business empire will continue?

"Ndwiga has trained me for over four years and I am more confident in myself now. I know that even when he retires, his legacy at Masinga will live on through us, his mentees," noted Tanui.

As we conclude the interview, I ask for a parting shot, the averagely built man, with a physique not quick to give away his age, composes himself and summarizes his time in KenGen.

"KenGen is like my mother. I have achieved so much working in this company. All my four children have gone to university. I am a proud man today and come February 2024, I will look back and say I served this great nation and trained the next generation for greatness," concluded Ndwiga.

Africa's Climate against a SustainableFuture

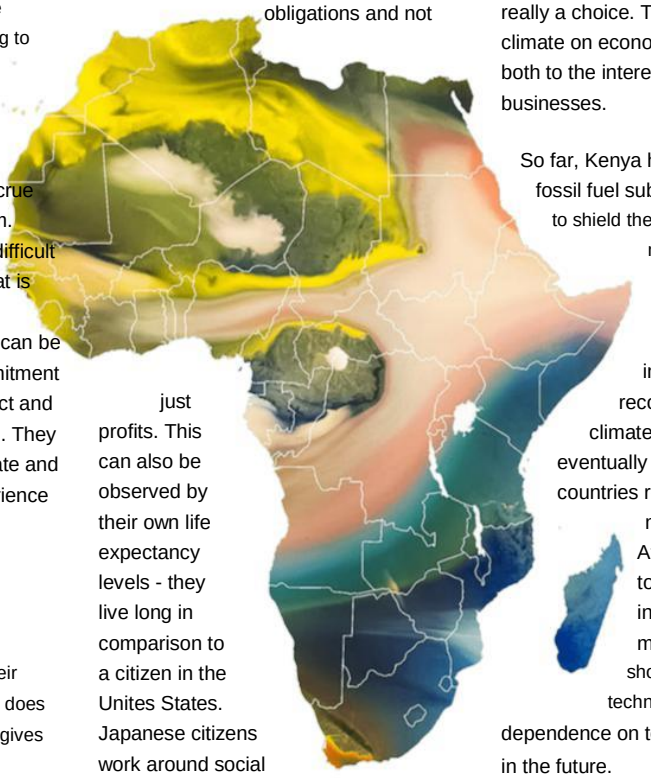
By Albert Barongo, NuPEA

How does the public equate success amidst a climate crisis? The question is posed not from mere public policy instinct, but from a place of personal conscience. As it seems, climate change has not been fully integrated at the basic level of people's lives, but rather perceived from a distant, as if it is not happening already. The people have not quite grasped relating climate to their economic woes, so why would graduates still struggle to get job opportunities,
it cannot be that they are not doing anything right, but rather the reason points towards a complex interaction between survival instincts, politics, climate and the world financial system.

The Climate Change debate provides an opportunity to negotiate and pursue development for the benefit of all. The energy sector is very much concerned with expanding energy infrastructure and increasing energy access, but do the people still have a sense of belonging to the nation? Could the less skilled at the bottom of society no longer want to be part of a larger society? The assumption is that opportunities for all only accrue when there is a sense of patriotism. Without opportunities it would be difficult to assume that one has a state that is cohesive. Energy Transition is geopolitically driven. Perhaps this can be seen with the huge financial commitment made by the Inflation Reduction Act and the European Union Global Shield. They all open up opportunities to innovate and assist their own countries to experience a rebound in economy.

It is an obligation of nations to bring prosperity to the people in view of their talents and expertise. Human capital does supersede profits, simply because it gives the assurance of continuity, unless of the intention to replace human contribution with machines. Climate Change, therefore, is not only about a contest of who is polluting more, but rather a contest against a prevailing social order. G20 countries have had an upsurge of cancer rates by 22 percent (1990-2019) mainly affecting 20 to 34-year olds, with the fastest increase being those between 15-39 years in upper middle income economies.

This increase is attributed to environment and lifestyles. Therefore, is climate change going to bring an end to belonging? The Market alone cannot be in control of the events associated to be an 'Act of God' that alone creates lots of social problems. It is the reason why countries like Japan have had to restructure the economy, making an obligation for corporates to fulfill their social and environmental obligations and not just profits. This can also be observed by their own life expectancy levels - they live long in comparison to a citizen in the Unites States. Japanese citizens work around social issues while building their economies. Technology is playing a critical role in their successes to spur manufacturing and a culture of innovation. This culture, if replicated across an entire society, really becomes a part of them. Beliefs hold a powerful force for establishing prosperous societies. Any alignment in terms of perspectives draws in solutions, but any form of opposition takes societies back.



The Sustainable Development Goals (SDGs) seek to be an equalizer in terms of bringing societies closer in healing the divide, in particular, setting the priorities for nations, thus the 2030 Agenda for Sustainable Development. The United Nations acclaims the people as the citizens of the world. This means that implementation of SDGs supersede the limitations imposed. Therefore, Climate Financing for all is an obligation and not really a choice. The significant impact of climate on economies is non-negotiable, both to the interest of nations and businesses.

So far, Kenya has done well to end fossil fuel subsidies, a decision taken to shield the poor and not the rich, making the climate debate to be about leveling opportunities for all. Finance institutions did not recognize that supporting climate policies would eventually enable developing countries repay their debts. It makes a difference if African countries are able to see themselves as an investment. Therefore, much attention should be given to build up technical people and reduce dependence on technical assistance in the future.

Time For Kenya to Leverage

Energy Tourism to Boost Economic Growth

By Eng. Peter Njenga, Managing Director and CEO – KenGen PLC

Kenya, a perennial magnet for tourists, witnesses an annual influx of hundreds of thousands of visitors. With the festive season approaching, the surge in both local and international tourists is imminent.

The allure of Kenya, often intertwined with Meetings, Incentives, Conferences, Exhibitions (MICE) and captivating safaris, has consistently earned the country recognition as a premier African tourism destination, as endorsed by the World Travel Awards (WTA).

In November 2023, Nairobi clinched the title of the top city to visit in 2024, according to Lonely Planet, a United States-based Travel Agency. While our pristine beaches, MICE offerings and awe-inspiring safaris continue to be the flag bearers of Kenya's tourism sector, there is untapped potential, such as energy tourism that merit exploration.

This calls for a strategic review by industry stakeholders to unlock opportunities within this sector and amplify returns from existing energy investments. Energy tourism, categorized under industrial tourism, encompasses visits to energy facilities like electricity generating plants, hydroelectric dams and renewable energy sites - abundant in Kenya.

A recent study, "Energy and Industrial Tourism: A Specific Niche in the Tourism Market," projects energy tourism to be the fastest-growing niche in adventure and industrial tourism. From the scenic Turkwel to the magical Olkaria steam fields and the expansive Seven Forks scheme, Kenya stands poised to bolster its tourism industry, attract foreign investment and underscore its leadership in green energy.

The Kenya Tourism Board's (KTB) latest report reveals that international arrivals surged to 847,810 in the first half of 2023, compared to 642,861 during the same period in 2022. While leisure, visiting friends and family, business travel and MICE dominate, embracing energy tourism can enrich tourists' understanding of both tourism and energy sustainability, thereby elevating the entire sector.

According to the World Travel and Tourism Council, the tourism industry has enhanced its carbon efficiency by nearly 20% in the last decade. Developing energy tourism as a niche provides an avenue to prioritize sustainable and energy-efficient travel options, including wind, hydro, geothermal, and solar energy.

KenGen, East Africa's leading electric energy producer has already taken the lead in energy tourism by establishing the largest geothermal spa in Africa, adjacent to its geothermal power stations in Olkaria. This innovative facility, a by-product of geothermal power generation has attracted close to a million visitors who not only enjoy a unique recreational experience, but also gain insights into power generation and the use of geothermal plants.

Countries like the USA, Canada, Australia and New Zealand have seen tourism trends shaped by the growing demand for energy tourism. Similar initiatives in Kenya can significantly impact emerging tourism sectors and promote energy literacy and renewable energy development as integral components of the national tourism strategy.

Increased investment in energy tourism can lead to sustainable energy development within the tourism sector, attracting foreign investment in the energy field. As globalization and industrialization continue, energy tourism presents a promising avenue for growth.

Energy tourism addresses the global need for energy literacy, aligning with efforts to meet the escalating demand for energy worldwide. The benefits extend to local economies, fostering energy literacy, promoting energy research and encouraging sustainable behavior to combat climate change.

As former United Nations Secretary General, Kofi Annan once said: "Our biggest challenge in this new century is to take an idea that seems abstract – sustainable development – and turn it into a reality for all the world's people." This is what the world is calling us to do now on energy tourism.

Indeed, the undeniable impact of energy tourism on the tourism industry, the growth of the energy sector and the global economy demonstrates the value of embracing energy tourism as a compelling imperative.

The writer is the Managing Director and CEO of Kenya Electricity Generating Company (KenGen) PLC

Email: md&ceo@kengen.co.ke
Twitter: @kenGenMDandCEO

Heat Energy in the Ocean

The What, the Where, the Who and the How Much

By Lucy Njue

As a geothermal expert, something small escaped my mind - okay something big, huge, astronomical and quite phenomenal. Typically, having learnt about geothermal in school and mastered it in the industry, the focus is normally what we can see - the geothermal energy on land.

Imagine my amazement when I was seconded to the International Seabed Authority as an Africa Deep Sea Resources (ADSR) expert to undertake research delving on heat energy in the sea, on the seabed/seafloor. Picture this, under the massive column of ocean water (thousands of meters deep), in all that pressure and freezing temperature, the earth is releasing heat energy with measured temperatures exceeding 400ºC.

Established under the 1982 UN Convention on the Law of the Sea (UNCLOS) and its 1994 Agreement on Implementation, the International Seabed Authority (ISA) is an intergovernmental body with 167 member states and the European Union. In addition to protecting the ecosystem of the seabed, ocean floor and subsoil in "The Area," which is outside of national jurisdiction, ISA is tasked with authorizing and overseeing the development of mineral-related operations in the international seabed, which is regarded as the "common heritage of all mankind." All solid, liquid, or gaseous mineral resources that are in situ within the ISA jurisdiction Area or beneath the seabed are considered "resources," according to a definition from the International Maritime Organization (IMO) and the ISA technical study No.25. This means that the heat energy emanating from hydrothermal vents outside national jurisdictions is under ISA.

What is this heat energy in the ocean?

Offshore hydrothermal vents are formed in proximity to crustal segments, where tectonic plates are continuously spreading, causing the rise of magma and formation of new oceanic crust. In these tectono-volcanic zones, sea water is forced down (due to pressure) into the hot oceanic crust, where it is critically heated, changing physico-chemistry and increasingly saturated with elements (metals) in solution minerals. Convection causes the heated water to rise to the sea floor where it is relatively conductively cooled before it reaches the seafloor and interacts with the surrounding sea water. The result of this reaction is the precipitation and deposition of minerals as well as the formation of hydrothermal vents. These vents channel hydrothermal fluids of varying temperatures and pressures above the sea floor, causing high heat flow in their surrounding areas. Heat is critical in the formation of polymetallic sulphides and it is, therefore, not surprising that their location and that of hydrothermal vents is matched. Hydrothermal vents manifest in the form of focused vents (so-called black and white smokers) characterized by mineralized chimneys spewing water as hot as 400oC, while diffuse vents emanate cooler water through cracks on the seafloor.

Geothermal resources on the seabed are immense because of numerous and intense tectono-volcanism along plate boundaries, specifically on ocean ridges, deep-sea trenches and linear fracture zones. Subsequently, enormous, dynamic and sometimes enigmatic plumes of hydrothermal fluid manifest in these localities (Pegler et al 2021).

Where is heat energy in the sea located?

Deep sea hydrothermal vents are formed where tectonic plates are continuously spreading, causing the rise of magma and formation of new oceanic crust.

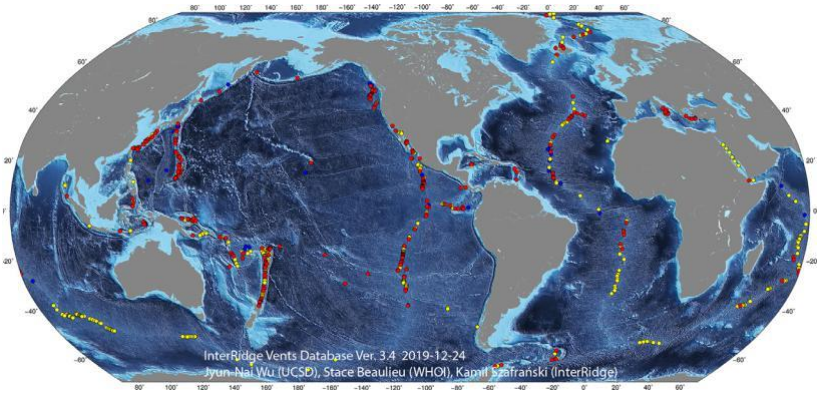


Figure 1: Mapped hydrothermal vents. Data source the InterRidge Vents Database Version 2.0 (Beaulieu et al., 2013, doi: 10.1002/2013GC004998).

Hydrothermal vents have been mapped in the following tectono - volcanic environments. **Mid-Oceanic ridges (MOR)** - It is the process of upwelling basaltic lava and lateral rifting (spreading) that creates mid-ocean ridges. The zones are typically areas of active tectonism, seismicity and high heat flow. Eventually, the magmatic intense heat produced along the ridges is dispersed by the circulation of seawater, thus frequently forming hydrothermal vents. Mapped hydrothermal vents on MORs account for 56% of the total known vents, according to data from the Interridge Vents Database Version 2.1 (Beaulieu et al., 2013, doi: 10.1002/2013GC004998).

Arc volcanos - Aqueous fluids and volatiles from the subducting plate by mantle heat, cause partial melting due to prevailing temperature and pressure. Subsequently the remelted material rises to the crust, forming a chain of volcanoes behind the subducting trench. Because of the heat factor and the surrounding fluids, hydrothermal activity is bound to occur. Based on current data of all known hydrothermal vents, approximately 21% occur on Arc volcanoes.

Back-arc spreading centres - These are associated with subduction zones and island arcs and are construed to be areas of extension where rifting and in a number of instances, seafloor spreading develops on the overriding plate at convergent plate margins (Seton and Müller 2006). A study by Du and Fisher (2018) provides evidence that hydrothermal vents located on back-arc basins can remain stable over a ten-year period. The measured temperatures from 41 vents located within back-arc spreading areas provide an average of 266°C, the highest being 380°C and the lowest 23°C. Back-arc centres, like MORs, form as a result of divergence. Interestingly, their associated vents imply higher temperature and greater depth in comparison to volcanic arcs and intra volcanic vents.

Intra plate volcanos - Hotspots and fracture zones are the focal source of intraplate volcanism and subsequent hydrothermal vents. The average measured temperature of the intraplate hydrothermal vents is low temperature, approximately 61ºC.

Who has an idea about how we can harness this heat?

A limited number of researchers have come up with different concepts of how to extract geothermal energy from the seabed. Trials and prototypes have been developed in the past and research is ongoing for a limited number of potential proposals. Nevertheless, it is evident that there are major challenges and considerable work is necessary to better understand our sea floor and particularly, the mid-ocean ridges in terms of energy exploitation. All the potentially suitable vent fields and their individual characteristics in terms of plumbing, activity, structures and other related controls must be fully understood. As a working hypothesis of my study, the imminent feasibility of the utilization of hydrothermal energy is for potential powering of deep-sea exploration equipment. After all, it is very dark on the oceans bottom.

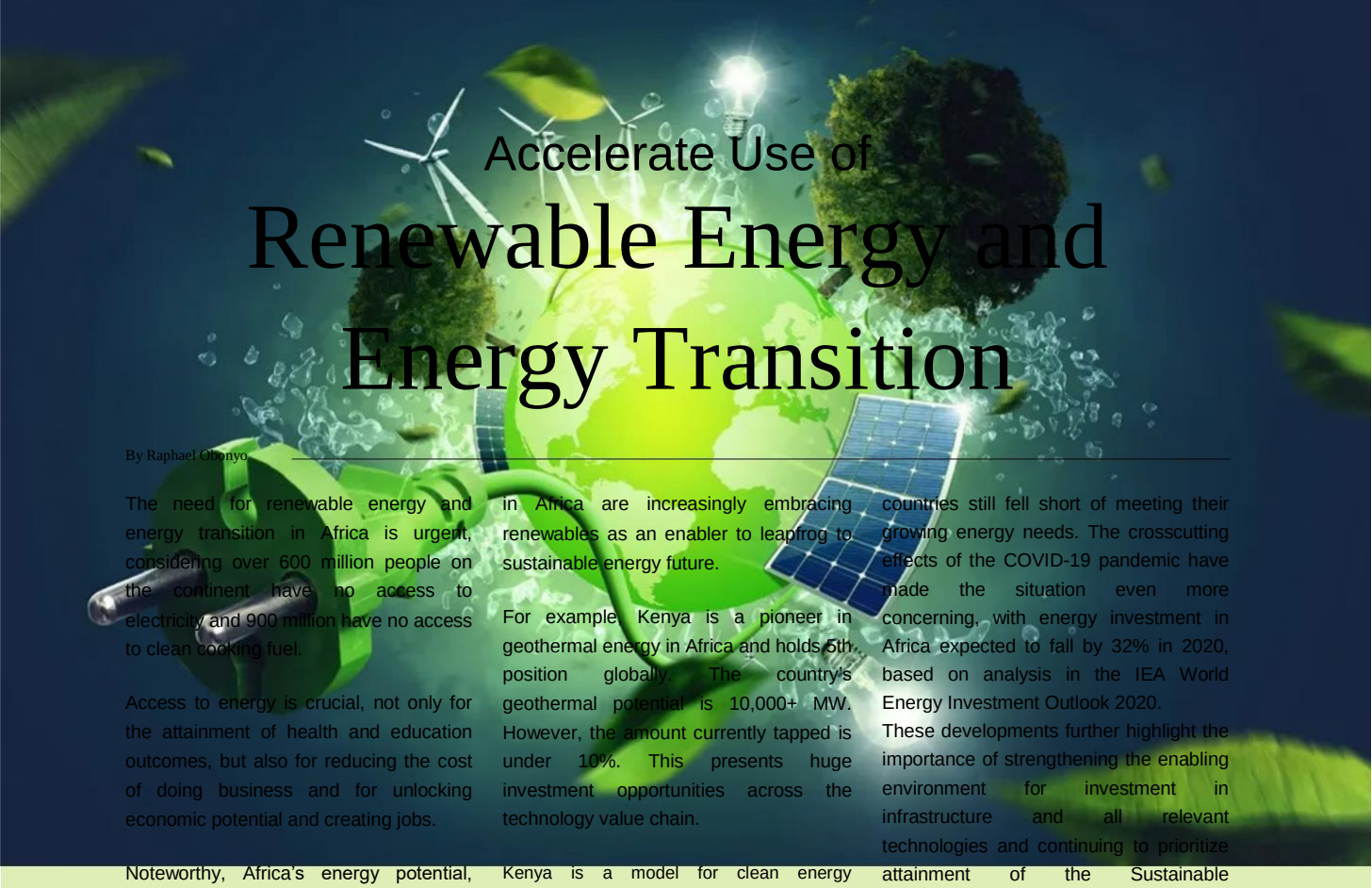
Summary of proposed utilization of hydrothermal energy on the ocean floor

YEAR	METHOD
2010	Hiriat et al (2010) propose a design that will utilize the hydrothermal vents using a submersible station. The design features an Organic Rankine binary plant with an inbuilt condensate pump, turbine, generator and control system.
2012	Jorge et al (2012) evaluates six methods for extraction of hydrothermal energy. The methods can be categorized as follows: *a. Drill-Based Systems require wells to be drilled to the side of hydrothermal vents mimicking the process of geothermal exploitation onshore.* *b. Venturi Unit system is designed to capture hydrothermal energy in seafloor areas that have relatively lower temperatures, lower flow rates but have extensive spatial distributions.* *c. Energy Collection directly on the Hydrothermal Vent. In these designs energy is harvested directly on the vent either by Closed and Open Cycle Systems or by covering the entire chimney of the vent.*
2013	Armani and Paltrinieri propose drilling a well on a seamount to a depth of up to 2 kilometres. Geothermal Energy will be extracted from the well connected to a power plant hoisted on a platform. This proposal is for the heat anomaly in the South Tyrrhenian Sea.
2016	The concept by Aryadi et al (2016) is similar to that by Hiriat et al (2010) and only differs in technology. The proposed model would tap electricity directly from the vent and use the organic Rankine cycle.
2016	Motivated by the challenge to power subsurface exploration equipment, Xie et al (2016) designed a thermoelectric converter that utilizes hydrothermal energy. During heat transfer, a temperature difference between the hydrothermal fluid and cold seawater creates energy. This energy can be converted to electrical energy through the Seebeck effect.

How much heat energy is estimated to be on the sea floor?

A very conservative figure of approximately 32,000MW was derived from calculations based on data from 721 mapped and measured hydrothermal vents - 284 in high seas and 437 national jurisdictions.

We have only touched the surface when it comes to energy on the sea floor because more than eighty percent of our ocean is still unexplored, unobserved and unmapped ……more than 80%.



Accelerate Use of Renewable Energy and Energy Transition

By Raphael Obonyo

The need for renewable energy and energy transition in Africa is urgent, considering over 600 million people on the continent have no access to electricity and 900 million have no access to clean cooking fuel.

Access to energy is crucial, not only for the attainment of health and education outcomes, but also for reducing the cost of doing business and for unlocking economic potential and creating jobs.

Noteworthy, Africa's energy potential, especially renewable energy, is enormous, yet only a fraction of it is being currently employed.

Forecasts by the International Renewable Energy Agency (IRENA) indicate that with the right policies, regulation, governance and access to financial markets, sub-Saharan Africa could meet up to 67 per cent of its energy needs by 2030.

An accelerated deployment of renewables can quench the energy thirst of growing economies and secure access for millions at speed unimaginable only a decade ago.

The good news is that a lot of countries in Africa are increasingly embracing renewables as an enabler to leapfrog to sustainable energy future.

For example, Kenya is a pioneer in geothermal energy in Africa and holds 5th position globally. The country's geothermal potential is 10,000+ MW. However, the amount currently tapped is under 10%. This presents huge investment opportunities across the technology value chain.

Kenya is a model for clean energy generation in Africa with around about 90 percent of our power coming from non-fossil fuel sources. The country is on track to provide universal energy access by 2022. Kenya is not only a leader in the region, but is poised to become a global leader for clean energy and climate action.

The world is going through profound change in energy and renewable energy has moved to the centre-stage of the global energy landscape and is now competitive with conventional energy sources in many places around the world.

An accelerated deployment of renewables can quench the energy thirst of growing economies and secure access for millions at speed unimaginable only a decade ago.

There is need to strengthen policy commitment, as policy and regulatory stability, transparency and predictability are fundamental to attracting investments and driving cost reduction. There is need to support innovation, not only in technologies, but also in policy, business models and market design.

The IEA's 2019 Africa Energy Outlook (AEO) showed how existing policy and investment plans in many African countries still fell short of meeting their growing energy needs. The crosscutting effects of the COVID-19 pandemic have made the situation even more concerning, with energy investment in Africa expected to fall by 32% in 2020, based on analysis in the IEA World Energy Investment Outlook 2020.

These developments further highlight the importance of strengthening the enabling environment for investment in infrastructure and all relevant technologies and continuing to prioritize attainment of the Sustainable Development Goals. Action on all these fronts is essential in Africa at this pivotal moment when the world collectively faces urgent and shared challenges to build back economies, create jobs and accelerate clean energy transitions.

Significant new investment is now critically needed to accelerate the growth of renewable energy in Africa so as to ensure sufficient, affordable, reliable energy for all citizens and drive inclusive, just and sustainable energy transitions.

Governments can play an enabling role by promoting and implementing policy interventions to enable this acceleration. These could be linked to related actions to strengthen energy security, scale up infrastructure investment and promote the growth of the green economy.

Also, governments need to collaborate more with the private sector. Investing in sustainable energy can be both effective and profitable.

Mr. Obonyo is a Public Policy Analyst. Email: raphojuma@hotmail.com

The Role of Off-Grid Solutions

in Addressing Energy Access Challenges in Kenya

By Lucy Muricho, Senior Officer, Communications – REREC

Access to modern energy services remains a significant challenge in many parts of Kenya, particularly in the off-grid areas. The emergence of off-grid solutions has brought hope in addressing this issue. This article explores the role of off-grid solutions in combating energy access challenges in Kenya and their potential impact on the lives of Kenyan communities living in these areas.

Kenya's economic development relies on electricity, as stated in the Government's Vision 2030 blueprint. However, there has been a significant disparity in electrification levels between grid and off-grid areas. Off-grid areas face energy access challenges that limit opportunities for education, healthcare, economic development and high quality of life. To bridge this gap, the Rural Electrification and Renewable Energy Corporation (REREC) has been implementing off-grid solutions to provide decentralized and sustainable energy access.

Off-grid electricity solutions generally function independent of the centralized power grid and make use of renewable energy sources such as solar, wind and mini-hydro. These solutions often involve small-scale systems like solar home systems, mini-grids and standalone solar-powered appliances.

Initially, REREC started the electrification of off-grid areas through the implementation of isolated diesel stations. Presently, in its move towards going green, the Corporation is now implementing the electrification of off-grid areas through hybridization of diesel power stations with solar, installation of solar mini-grids and in some cases, extension of the grid extension to reach off-grid areas.

The Government has recognized the importance of off-grid solutions in addressing energy poverty. Initiatives such as the Kenya Off-Grid Solar Access Project (KOSAP) have been launched to promote the deployment of off-grid technologies across the country. KOSAP is a flagship project of the Ministry of Energy and Petroleum (MoEP), financed by the World Bank. It aims at providing electricity and clean cooking solutions in remote, low-density and traditionally underserved areas of the country. The project is part of the government's commitment to providing universal access to electricity in Kenya by 2030. The project is implemented jointly by MoEP, REREC and Kenya Power. It targets to reach approximately 277,000 households (1.5 million people) in the 14 Counties of West Pokot, Turkana, Marsabit, Samburu, Isiolo, Mandera, Wajir, Garissa, Tana River, Lamu, Kilifi, Kwale, Taita Taveta and Narok, through construction of 122 mini-grids and the sale of 250,000 standalone solar systems. In addition, 387 public facilities such as secondary schools, health facilities and administrative offices will be electrified through solar power; while 380 existing community boreholes will be retrofitted with solar water pumps.

In addressing energy access challenges in far-flung areas, off grid solutions are more advantageous in many ways. Their ease in deployment provides speedy access to electricity in areas where grid extension is not feasible in the short term. They are also more cost-effective than extending the main grid to remote areas, eliminating the need for extensive infrastructure development and reducing transmission losses. They also promote environmental sustainability as they mostly rely on renewable energy sources, reducing reliance on fossil fuels and mitigating GreenHouse Gas (GHG) emissions. In many instances, off-grid solutions also empower local communities by providing them with the means to generate their own electricity and become self-sufficient. Following implementation, off-grid solutions normally have a high impact on education and healthcare services by powering lighting, computers, medical equipment and refrigeration for vaccines. This improves educational outcomes and enables better healthcare delivery.

Off-grid electrification also unlocks economic opportunities and enhances productivity by providing electricity for small businesses, agriculture and productive use applications resulting in income generation, job creation and overall economic development. Additionally, the retrofitting of community boreholes with solar water pumps will provide access to clean water, further improving health and well-being in these areas.

Off-grid solutions have emerged as a game-changer in addressing energy access challenges in Kenya. By providing affordable and sustainable electricity access to remote communities, these solutions have the potential to transform lives, provide the community with high quality life, improve education and healthcare outcomes, provide access to clean water, drive economic growth and empower local communities. With continued support from stakeholders and innovative approaches, off-grid solutions can contribute significantly to eradicating energy poverty and fostering a brighter future for all Kenyans.

Earth Observation Technologies Hold the Potential for Continental Energy Security

By Nancy Marangu, Communication & Public Policy Analyst

The future of inclusive energy security lies at the mastery of the use of earth observation technologies for different functionalities. This is with the appreciation that Africa's wealth of renewable energy resources positions the continent strategically to lever on its youth bulge to create accessible and inclusive alternative energy solutions for the future. Africa has the potential to meet 25% of its energy needs from renewable energy sources by 2030. Further, increase this fraction to approximately 66% by 2050, according to the International Renewable Energy Agency report 2020 on scaling up renewable energy deployment in Africa.

The aforementioned projections are attainable by leveraging/ use of earth observation technologies provided by the Digital Earth Africa (DE Africa). DE Africa enables stakeholders from governments, renewable energy industry, researchers, policy makers and academia utilize and access the platform for free, as a commitment to provide the platform for public good. Furthermore, the analysis tools allow communities to obtain essential insights they can apply directly to their conservation efforts. Essentially, DE Africa platform has capability to improve the lives of people across the African continent by translating earth observations into insights that support a sustainable urban future through inclusive and effective multilateralism. The analysis tools and services provide enhanced support for planning and decision making on energy security, climate action and reporting, agriculture and food security, water resources and flood risk, land degradation and urbanisation.

Empirically, the Broader perspectives on Digital Earth Africa Report 2020, underscores that DE Africa is a continental-scale data infrastructure that democratizes the ability to process and analyse satellite information on Africa. The platform provides analysis-ready data that is timely and current, enabling strategic and inclusive decision making that can be used to scale up the uptake of renewable energy resources to enhance resilient settlements within informal settlements.

Notably, the DE Africa Earth Observation (EO) technologies can provide an impact of approximately USD27 million in three key areas that have the highest future potential: wind, solar and hydropower energy. Earth observation can support identification of viable renewable energy sites and provide data points for optimal resource exploitation and production forecasting to reduce costs and ensure efficiencies.

Significantly, earth observation data is a source of distinctive, reliable and measurable information that can inform the assessment, prevention and mitigation of biodiversity conservation. Earth observation plays a crucial role in setting up renewable energy production plants by identifying suitable sites and aiding in plant design. The use of earth observation is critical in planning the plants efficiently by providing data points for optimal resource exploitation, efficient monitoring and forecasting of production levels that can mainstream biodiversity into urban and territorial planning. Consequently, earth observation plays a pivotal role in implementing both onshore and offshore wind energy solutions across Africa, as it provides accurate and timely information on a variety of environmental parameters such as: wind and waves, weather conditions, topography and vegetation cover, which are critical inputs for modelling wind energy. This data can help ensure that wind turbines are placed in the right locations to benefit society without impacting regional biodiversity.

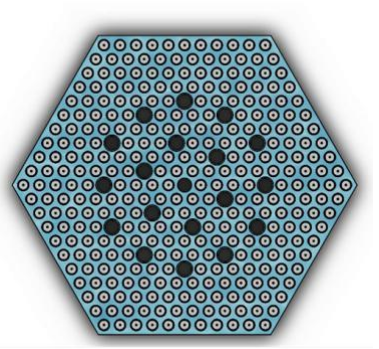
Although, earth observation is an enabler to energy security, there is urgency to provide scientific support for stakeholder policy analyses and research teams to interrogate how youth with disabilities can leverage on its capabilities to innovate homegrown solutions. The goal is to ensure that Africa's youth bulge and specifically youth with disabilities can create intergenerational renewable products and solutions and equitably benefit from the DE Africa earth observation technologies.

Conclusively, DE Africa responds to the continent's information needs, challenges and priorities, including, the African Union's Innovation the Science, Technology and Innovation Strategy for Africa (STISA-2024). The strategy emphasizes, earth observation, navigation and positioning, satellite communication space science and astronomy, presents unique opportunities continentally to address socio-economic development issues whereas monitoring Africa's abundant natural resources, such as minerals and biodiversity. Moreover, the African Union Agenda 2063 and Sustainable Development Goals (SDGs): SDGs Nos. 6, 7, 11, 10 and 17. The goal is to achieve the sustainable development goals in times of global crisis, through mainstreamed inclusive digital urban planning and sustainable infrastructure development, while levering on the creativity of the youth and onboarding youth with disabilities.

A Kenyan Power Grid with Pressurized Light-Weight Water Reactor Units

By SIRO Robert Folkenberg, Nuclear Engineering and Thermal Physics, National Research Nuclear University (NRNU MEPhI), Russia; Russian Nuclear Education Ambassador

Nuclear energy already represents quite a significant chunk of the energy space supplying approximately 11% of the global electricity. Many countries are considering the introduction of nuclear power in the energy mix and Kenya, a regional giant, is not left behind in this endeavour. Kenya, through its leading electric power generation company in East Africa (KenGen), in its quest to embrace energy grid diversification, has demonstrated commitment to exploration of renewable energy resources in addition to supplementing these resources with alternative energy solutions. Ranked at position seven globally and first place in Africa as a geothermal power producer, Kenya needs to further tap into its untapped geothermal potential and at the same time, embrace a balanced and diverse energy grid, not one that is heavily reliant on geothermal resource.



This balance could be fostered by introducing nuclear power in the mix. As an engineering student who has spent most of his time delving into the insights of energy, I have come to realize that energy diversification is a healthy endeavour in energy innovation and as a Kenyan, I am convinced beyond reasonable doubt that including nuclear energy in our diversification plan of the power grid would not only be a huge boost towards the implementation of the much anticipated 'Vision 2030,' but also a guarantee on reliable, affordable and almost infinite supply of energy that is independent of prevailing climatic and weather conditions.

With reference to the time left to the year 2030, we are already behind schedule, and it is a high time we acknowledge that a concentrated source of energy like nuclear is a practical alternative solution on the table, that is, if we intend to closely beat the stipulated deadline. Egypt has already acknowledged the need for nuclear power flavour in its mix and is constructing 4 units of VVER-1200, one of the world's most widely used Pressurized Water Reactors (PWR) that uses light-weight water, both as a primary coolant and as a moderator. In this piece, there is a light delve into the outlook of national power grid if Kenya were to consider introducing, say 1200MW active power PWRs into its power grid.

In 2013, the government of Kenya unveiled a strategy to increase production by 3336MW by the end 2017 as a measure to address the projected energy gap and demand by then. However, according to the Energy and Petroleum Regulatory Authority (EPRA), as of June, 2022, Kenya's installed electrical capacity in the power grid stood at 3074MW. It is clearly the case that this strategy did not work. One of the possible reasons why it failed is the exclusion of nuclear technology in its framework. The strategy concentrated on adoption of renewable technologies alone and had to incur the nuisance associated with the development of renewable energy including technological aspects, economical aspects and adopted renewable energy policies.

Even though we have witnessed major advancements in renewable energy technologies in the recent years, there are technical barriers that must be overcome to fully adopt them.

Even though we have witnessed major advancements in renewable energy technologies in the recent years, there are

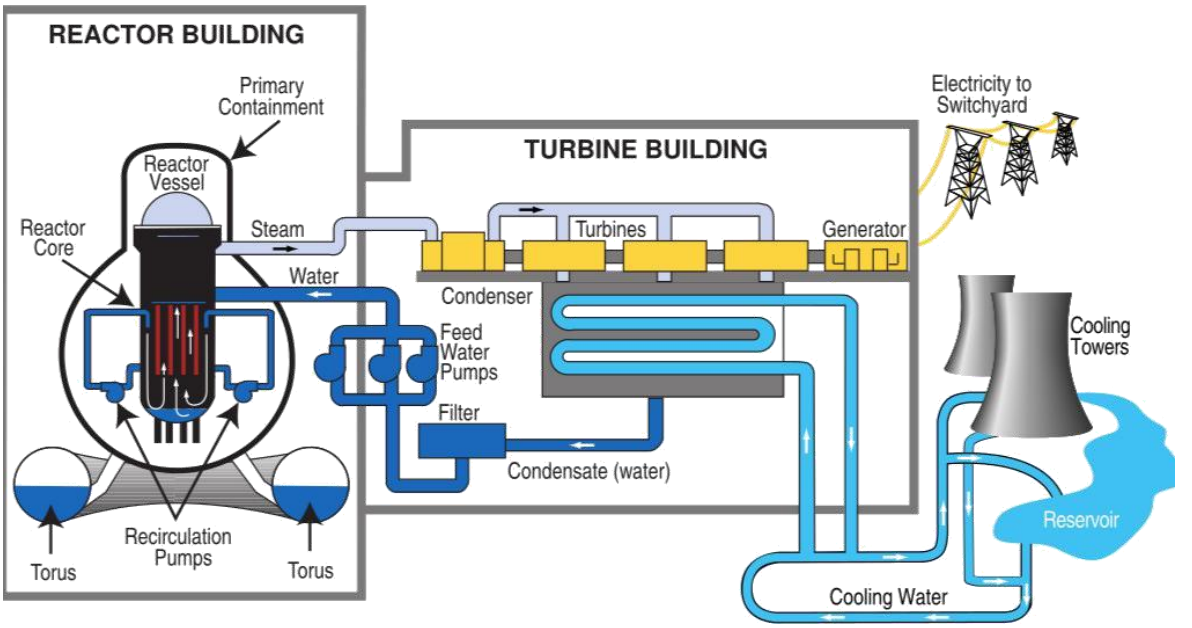


Image Source: Wikimedia Commons- nuclear power plant diagram

technical barriers that must be overcome to fully adopt them. A case example of these challenges is the grid instability, which is a consequence of the absence of energy storage systems. It is also important to acknowledge the absence of skilled manpower for some renewable energy technologies. Economically, the financial institutions in Kenya see an adventure into renewables as a risk they are not ready to embrace.

In comparison to other sources, nuclear energy has the highest capacity factor - approximately 92%. In other words, 92% of the time, nuclear energy registers maximum power. This is a technology that has been designed to not fail, but to operate without being subjected to regular maintenance for a long period of time before refueling.

Now, let us see how a nuclear reactor would bring us close to beating the deadline. We will consider the formerly quoted figure, 3074MW as the reference figure from which we will picture the possible outlook of the power grid in the event Kenya decides to go nuclear with the PWRs. With the rapidly rising population, by 2030, Kenya's population is expected to be above 66 million and the demand is expected to continue rising, while at the same time, we intend to attain universal access as stipulated in the Big 4 Agenda.

We need affordable, reliable, but concentrated energy. In comparison to other sources, nuclear energy has the highest capacity factor - approximately 92%. In other words, 92% of the time, nuclear energy registers maximum power. This is a technology that has been designed to not fail, but to operate without being subjected to regular maintenance for a long period of time before refueling. On a light note, considering the reference value representing the currently installed capacity in the national power grid, a single unit of PWR, with a rating of say, 1200MW active power would supply 39% of this value. One such type of PWR is the VVER-1200. To double the installed capacity, we would need 2,5 units of VVER-1200, or 3 units. 3 units of VVER-1200 in the Kenyan power grid would mean 3600MW of power that is available in the entire year at base-load.

This would mean half of the grid exhibiting a stable power supply for driving manufacturing and other key aspects of a vibrant economy. At this point in time, there is nothing stopping us from introducing nuclear power in the energy mix. As the most recent follow-up, integrated nuclear infrastructure mission constituting a delegate of experts from the International Atomic Energy Agency acknowledged the significant strides in Kenya's preparedness for nuclear power in key areas such as the development of the 'National Nuclear Policy and the National Policy and Strategy for Safety,' a comprehensive assessment of the national legal framework, establishment of a nuclear regulatory body with clearly stipulated responsibilities.

This is a demonstration of resolute commitment to introducing nuclear power in the energy mix and one that will address our energy needs in no time.

Green industrialization, a Critical Pathway to Kenya's Energy Transition

By Thuo Njoroge Daniel, Energy Economist and Director of Research & Policy - The Africa Utility Forum

The last major disruption to the electricity sector was in the 1990s, under the influence of the Washington Consensus and ended up spreading across the developing world. This approach advocated restructuring of national power utilities to create avenues for competition and efficiency while delegating responsibilities to the private sector under a clear regulatory framework. Over the next two decades, the world will experience increased technological disruptions that are inherently going to shape business model and market design in the electricity space, particularly as renewable share increase, going forward.

Potential disruption includes the move towards cleaner energy use which eminently requires de-carbonization approaches to electricity systems and industrial processes. Digitization is essentially energy internet of things as well as transition to electric vehicle. Others include a growing need for a data centre as consumer behaviour dictates that more and more of entities will continue to embrace digital platforms as avenues to do business. High factory automation, robotics and augmented reality will dominate the next phase of industrialization commonly referred to as the 4th industrial revolution.

Africa, typically lags behind the developed world. The explosion in the number of data centres is now hitting the continent's shore. The region has experienced the highest urban growth during the last two decades at 3.5 per-cent per year and this rate of growth is expected to hold into 2050, according to the most recent data by Brookings institution publication. Projections also indicate that between 2010 and 2025, some cities in Africa will account for up to 85 per-cent of the population. The report further indicates that in 2010, the share of the African urban population was about 36 per-cent and is projected to increase to 50 and 60 per-cent by 2030 and 2050 respectively.

As the number of global internet users continue to grow, so will the demand for data centre services continue to gain prominence as an industry. Between 2010 and 2018, global IP traffic - the quantity of data traversing the internet increased more than ten-fold, while global data centre storage capacity increased by a factor of 25 in parallel. Data services have played a critical role particularly in the post-covid dispensation and will continue to do so going forward. World-bank estimates over 70 per-cent of organisation in Africa will shift to the cloud by 2025 with South Africa, Kenya, Morrocco, Egypt and Nigeria leading the move to a digitally driven economy. These strong growth trends are expected to persist as the world consumes more and more data as new forms of information and digital services adaptation which are exceptionally computationally intensive, continue to accelerate demand growth for electricity.

Strategically, Kenya has put in place systems and mechanism, not only to leverage on this nascent industry, but also to drive de-carbonization of industrial processes through the leverage on geothermal as a derivative energy asset to drive sustainable growth. Being a regional hub for data centres in the East and Central frontier, Kenya's planned framework, conceived in 2019, seeks to drive the green industrialization agenda as a critical energy transition pathways for the nation.

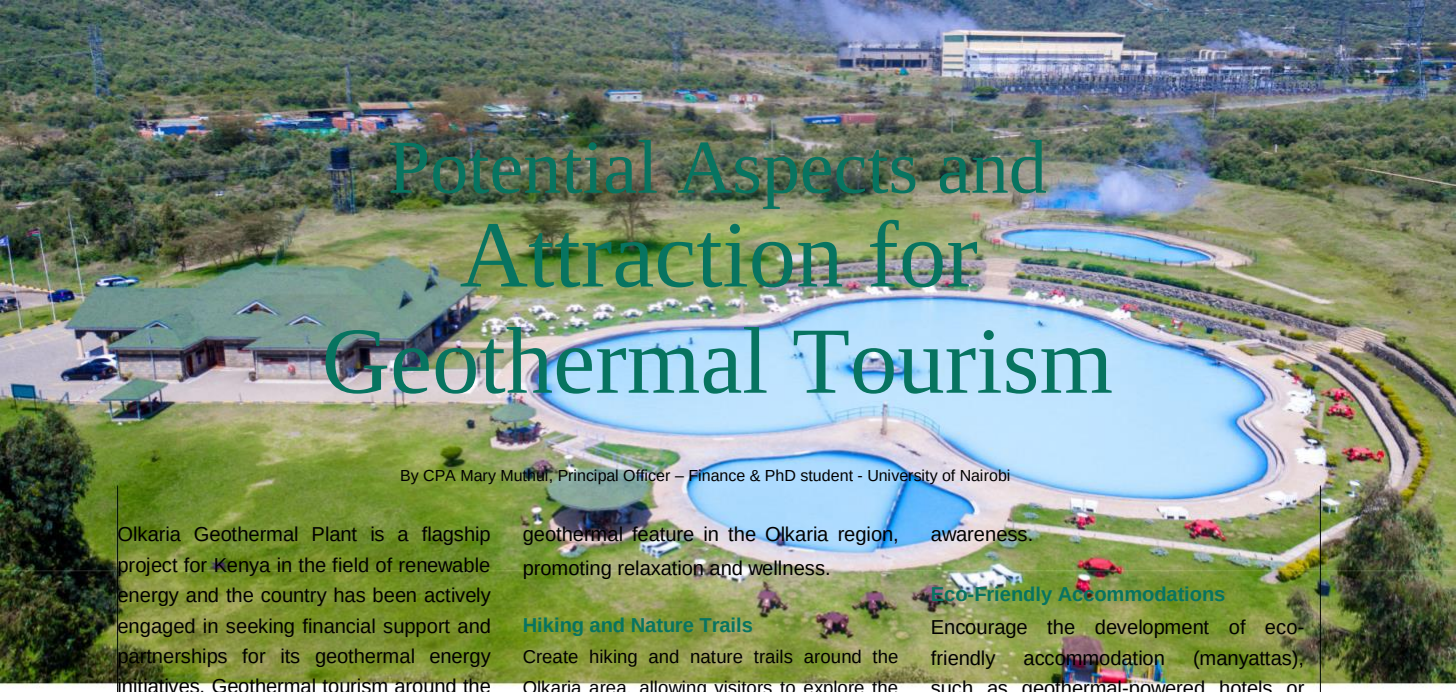
Through its utility company KenGen, the economy is working on rolling out the first of its kind, green enabled, 70MW data centre in Africa. Some of the world's largest data centres can each contain many tens of thousands of IT devices and require more than 100MW of power capacity.

Emerging services and technologies such as streaming, block-chain, machine learning are poised to boost demand for data services, which predominately means data centres could potentially become an anchor demand for electricity in Kenya and beyond.

Studies by Kenya Data Centre Market Investment Analysis Report 2023-2028 estimates market value for data centre services in Kenya as of 2022 to have been US$187 million and expected to grow to US$400 million by 2028. As companies begin to adopt new business models that align towards attainment of net-zero, Kenya's appetite as an investment destination of choice position for data services continues to grow, given the unique access to renewable power supply, which represents at least 80% of total power production, is another significant pull factor.

Finally, as the world moves towards hosting data centres closer to where it is ultimately consumed, fuelled by data protection regulations, issues of data residency and sovereignty and the need to lower latency to enable better data service management, Africa stands to benefit immensely as this presents both opportunities and risk. The onus is, therefore, on us, our leaders and policy makers to ensure with this comes inclusive growth.

Email: buttinjorob80@gmail.com



Potential Aspects and Attraction for Geothermal Tourism

By CPA Mary Muthui, Principal Officer – Finance & PhD student - University of Nairobi

Olkaria Geothermal Plant is a flagship project for Kenya in the field of renewable energy and the country has been actively engaged in seeking financial support and partnerships for its geothermal energy initiatives. Geothermal tourism around the Olkaria region, where the Olkaria Geothermal Plant is situated could offer visitors a unique and educational experience centred on geothermal energy and the natural features of the area. Here are potential aspects and attractions that could be included in a geothermal tourism initiative:

Geothermal Power Plant Tours

Organize guided tours of the Olkaria Geothermal Plant, providing visitors with insights into the process of geothermal energy generation. Explain the technology, drilling of geothermal wells and the overall operation of the plant.

Educational Workshops and Exhibitions

Host educational workshops and exhibitions focused on geothermal energy, sustainable practices and environmental conservation. This could include interactive displays, models and presentations to engage visitors of all ages.

Visitor and Interpretive Centres

Establish visitor centres with information on geothermal energy, the geological features of the region and the benefits of sustainable energy. Interpretive centres could provide a deeper understanding of the local ecosystem and its significance.

Geothermal Springs and Spas

Improve and develop geothermal springs and spas for recreational use. These could offer visitors the opportunity to enjoy natural hot springs, which are a common geothermal feature in the Olkaria region, promoting relaxation and wellness.

Hiking and Nature Trails

Create hiking and nature trails around the Olkaria area, allowing visitors to explore the unique geological formations, flora and fauna associated with geothermal regions. Interpretive signage along the trails could provide educational information.

Cultural Experiences

Integrate cultural experience (Maasai communities) into geothermal tourism, showcasing the local communities' traditions, art and cuisine. This could involve collaboration with local artisans, chefs and performers to enhance the overall visitor experience.

Geothermal Research Centers

Establish and improve more research centres, focused on geothermal energy and related environmental studies. These centres could collaborate with educational institutions and researchers, providing a platform for ongoing studies and scientific outreach.

Adventure Activities

Offer adventure activities such as geothermal mud baths or even geothermal cooking experiences. These activities could showcase the diverse uses of geothermal energy and its applications beyond electricity generation.

Geothermal Energy Education Programs

Develop educational programs for schools and students, encouraging field trips to learn about renewable energy and sustainability. These programs could be designed to complement the national curriculum and promote environmental awareness.

Eco-Friendly Accommodations

Encourage the development of eco-friendly accommodation (manyattas), such as geothermal-powered hotels or lodges. The accommodation could showcase sustainable practices and offer a comfortable stay for eco-conscious travellers.

Local Community Involvement

Involve the local community in geothermal tourism initiatives, ensuring that the benefits are shared. This could include community-guided tours, local handicraft markets and cultural performances.

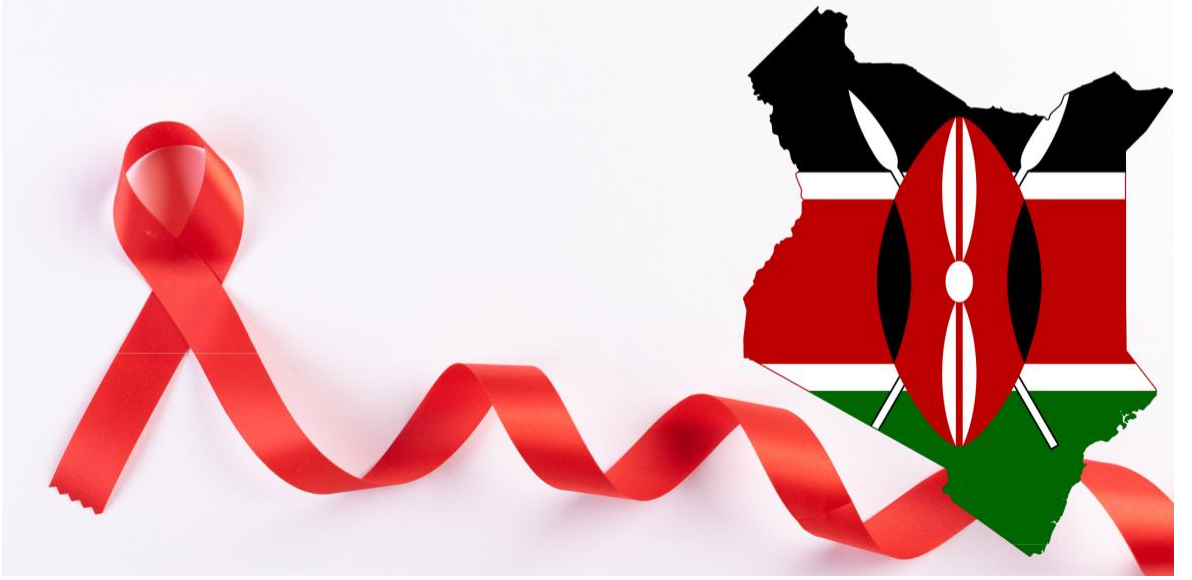
Conservation Initiatives

Implement conservation initiatives to protect the natural environment and biodiversity of the Olkaria region. This could involve habitat restoration, wildlife conservation and sustainable land management practices.

By carefully planning and integrating these elements, geothermal tourism around the Olkaria region has the potential to attract visitors interested in sustainable energy, nature and cultural experiences, contributing to both local economic development and environmental education.

Rapid Rise Of HIV/Aids in Kenya

By Jackline Mercy Nelly, Bomet University



Human Immunodeficiency Virus (HIV) is a widespread disease which has no cure. It has rapidly risen with a negative effect in the country.

Its causes are unprotected sex, sharing of piercing tools, infected mother to the baby during breastfeeding and transfer of blood from infected person to a healthy person. Among all those, unprotected sexual behaviour is the main cause.

Different measures can be taken to control its spread. These include, abstaining from unprotected sex, avoiding the sharing of piercing tools and proper screening of blood before transfusion. Nursing mothers should be educated on how to feed the infants, ensuring they are highly protected from getting infected. The disease has risen in various parts of the country including, Nairobi, Mombasa and Kisumu, among others.

The negative effects of HIV are increased poverty due to high dependency rate, high death rate and increased number of orphans in the country.

In conclusion, the preventive measures above should be put into practice since AIDS has no cure.

Increased Teenage Pregnancies Among Young Girls

Teenage pregnancy is getting pregnant between the ages of 13-19. Early pregnancy leads to health complications during pregnancy and childbirth. Premature birth and low birth weight also occur. It also leads to increased school dropouts.

Some of the circumstances forcing young girls to engage in sex at an early age are, lack of adequate finances to cater for their needs, lack of knowledge about the negative effects of sex, peer pressure and curiosity. The government is trying its best in trying to solve the problem by introducing sexual education at primary school level. Religious institutions have also shown concern by organising conferences for teaching young girls on the importance of abstaining from sex. Measures should be taken to ensure that young girls are protected from getting pregnant at an early age.

Rain, Not Dams, Cause Flooding, Says MP

By Paul Kimanzi, Principal Officer – Communication

In a decisive turn of events during a tour of the Eastern Region on Friday, Garissa Township Member of Parliament, Hon. Dekow Barrow dismissed longstanding accusations that KenGen's hydro dams are the culprits behind flooding in Northern Kenya.

Accompanying Cabinet Secretary, Ministry of Energy and Petroleum, Davis Chirchir, Principal Secretary, State Department of Energy, Alex Wachira and KenGen Managing Director and CEO, Eng. Peter Njenga on the tour to assess hydro dam performance, Hon. Barrow addressed the media, declaring, "Garissa is already flooded. We had the belief that the water was coming from the dams. We have confirmed the water is coming from the rains."

During the tour, Barrow emphasized that there was no evidence of spillage from the dams, noting that their primary concern was the potential adverse effects on the population if the dams were to overflow. Garissa, situated in Northern Kenya, has been significantly impacted by flooding.

"The dams are not the problem, but the rains," asserted the legislator.

Dispelling growing misinformation associating KenGen with flooding, Hon. Barrow confirmed the unsubstantiated claims during a press briefing at the conclusion of the tour.

KenGen's Managing Director and CEO, Eng. Peter Njenga emphasised the critical role the dams play in mitigating flooding, stating, "The dams minimize risks of flooding downstream."

In a final twist of clarity, MP Barrow creatively underscored the company's innocence during the tour and after his speech, rains began, like nature giving its nod of approval.

The majestic symphony of Nature: A call to Reconnect

Brenda Chebasa, Bomet

In a world brimming with technology and urbanization, it is easy to overlook the profound beauty and importance of nature, yet the intricate tapestry of the natural world holds the key to our physical and mental well-being. As we race through life, it is fundamental to pause, reflect and embrace the wonders of nature that surround us. Let us embark on a journey to reconnect with the serenity and harmony that nature offers.

The Healing power of Nature

Nature has an inherent ability to heal our weary skills and rejuvenate our spirits. Countless studies have shown that spending time in nature reduces stress, improves mood and enhances overall well-being. Whether it is the calming sound of a bubbling brook, the gentle rustle of leaves or the vibrant colors of a sunset, nature has an extraordinary ability to soothe and restore us.

Biodiversity: A treasure trove of life

The diverse ecosystems found within our planet are home to an astounding array of species, each playing a crucial role in maintaining the delicate balance of nature. From the majestic elephants roaming the savannahs to the microscopic organisms thriving in the depths of our oceans, the rich biodiversity of our planet is a testament to the resilience and interconnectedness of life. Preserving and protecting these ecosystems is not only a moral obligation, but a necessity for our own survival.

Nature's lessons

Nature is a master teacher, imparting invaluable lessons to those willing to listen. The cycle of life and death, the resilience of plants in harsh conditions and the symbiotic relationships between different species, all demonstrate the importance of adaptation, cooperation and balance. By observing and learning from nature, we can gain insights into our own lives, relationships and the world around us.

Conservation: Our Responsibility

As custodians of this planet, it is our responsibility to protect and conserve nature for future generations. The devastating effects of climate change, deforestation and pollution are already evident, threatening the very fabric of our existence. It is imperative that we take immediate action to reverse these trends, adopting sustainable practices, supporting conservation efforts and advocating for policies that prioritize the preservation of our natural resources.

Reconnecting with nature

Reconnecting with nature does not require grand gestures. It can be as simple as taking a walk in the park, tending to a garden or gazing at the stars on a clear night. Disconnect from digital world and immerse yourself in the sights, sounds and scents of nature. Feel the grass beneath your feet, breath in the fresh forest air and allow your senses to be awakened by the wonders that sound you.

Nature is not a mere backdrop to our lives. It is a vital part of who we are. By reconnecting with nature, we can rediscover our place in the world and rekindle our sense of wonder and awe. Let us embrace the healing power of nature, learn from its teaching and take action to protect and preserve the precious ecosystems that sustain us. In doing so, we can ensure a harmonious co-existence with nature and leave a legacy of beauty and biodiversity for generations to come.

Kenya has rapidly and unapologetically cemented itself as an investment hub

Green Energy The Saviour of Kenya's Economy

By Elizabeth Gakunga, Geologist

for most, if not all green-related projects. This can be observed clearly from its leading status in Africa for utilizing green resources in electrification and ranking seventh globally in geothermal energy production. Kenya has it all, from geothermal, which produces approximately 953.7MW, hydro which comes second at 867.54MW, solar and wind which produce a combined 702.42MW and Biomass which produces 89.48MW as indicated in the latest EPRA biannual report.

The country is mostly powered by renewables which amount to approximately 92% of the total consumption and it is on course to approach the set target of 100% green utilization by 2030. The country has an enormous energy potential and the remaining energy can be used to power neighbouring countries in a bid to assist in achieving the universal electrification target. This is not farfetched as there is still a bigger area left unexplored, especially in the geothermal sector. However, even with all these efforts put together, electricity prices remain relatively higher than in other nations which have less reliance on their renewables, ultimately raising concerns. KIPPRA details this challenge by explaining how the electricity demand is highly inelastic, which means consumers will have to forego other expenditure to afford the high costs of electricity.

The pricing is done by EPRA which aims to generate sufficient revenue that will meet the relevant requirements and includes the cost of power generation, pass-through costs, system losses, various taxes and levies. The major setback comes from the companies in charge of distribution and transmission as documented by the Economist Intelligence Union (EIU). Frequent government interference and illegal connections lead to heavy system losses. Underinvestment in Transmission Company constitute various power outages as has been the case this year. AFDB reports that transmission losses cost Kenya US$17 million annually.

Provided the country maintains an accommodating stance towards private investments and continues to respect contract terms, foreign investments will be the key to improving the economy.

Green energy has the potential to not only deal with these challenges, but to also strengthen the Kenyan currency. CBK explains how a weaker shilling promotes domestic investments and discourages imports. This is a good window of opportunity to boost the local industries by awarding them those contracts. Local manufacturers comprehend the client's needs more intimately, facilitating superior service provision through close collaboration with the company and on-site presence. In the event of repairs, their proximity ensures swift resolution, saving both time and expenses.

Kenya has been able to bag some serious investment deals because of the efforts made to place the country at the frontlines of dealing with SDGs 7 and 9 and not by pulling the victim stance all the time. Provided the country maintains an accommodating stance towards private investments and continues to respect contract terms, foreign investments will be the key to improving the economy. According to the UN, climate change is the biggest challenge of our time, while the London School of Economics recognizes that net zero transmission and digital transformation are the two most powerful forces of this century. If the country uses this window wisely, it can tackle most of its problems quickly and efficiently. Global countries will be more willing to back us up with advanced technology equipped with Artificial Intelligence to revamp our transmission lines if we actively show our commitment to participate in the universal electrification agenda by powering the neighbouring countries with the excess generated electricity.

SOME OF THE INVESTMENTS INCLUDE:

1. Rolls-Royce, the renowned UK engineering firm is planning to make its first mark in East Africa. It has two other offices in the continent which are situated in South Africa and Nigeria. It has selected Kenya due to its abundance in green energy and raw materials which will see it making Sustainable Aviation Fuels (SAFs) compatible with their Trent engines. They are planning to power locomotives for Kenya Railways Cooperation and offer tailored electricity solutions for data centres.

2. Octavia Carbon Company is planning to sequester atmospheric carbon into the basaltic rocks of the Kenyan Rift System by using their manufactured Direct Air Capture (DAC) machines which are proposed to go online by 2025. They will also use geothermal heat and electricity generated locally to power these DAC machines.

3. Green hydrogen deal with the European Union and Global Gateway Support after the African Climate Summit, 2023. The green hydrogen vision came to life after realizing that the ample renewable resources in Kenya can support large-scale green hydrogen production without negatively impacting the electricity access or supply to the consumers. For instance, the geothermal steam is so vast, that they are at times left open to escape the atmosphere at night. This will ensure full utilization of the available renewables. UN documents that green hydrogen as a fuel would produce thrice as much energy than diesel or gasoline.

4. KenGen and Konza Technopolis Development Authority (KoTDA) have broken ground for the Green Energy Park which is to be situated in the Greater Olkaria Volcanic Complex. The Park will house offices, data centres which Eco Cloud has already shown interest in, research and development centres etc. The project will be implemented in a 4-phase plan starting from 2025-2045. The Green Energy Park will utilize geothermal steam for heating and electricity.

5. In the UK-Kenya green investment plan which will run for the next 5 years, GDC and Globeleq, a UK firm backed by its government broke ground in June this year to construct a 35MW Menengai Geothermal power plant which is estimated to power 750,000 homes.

6. Nairobi Railway City saw construction which began in December 2022. The construction will be a cutting-edge development utilizing green resources and will connect to the Bus Rapid Transit (BRT) system. UK architects from Atkins have won the contract to design the project. Additionally, they have also pledged to provide 100 electric buses as part of the initiative.

7. The World Bank (WB) has chosen KenGen PLC as its implementing agency for BESS batteries which is funded by its Resilient Expansion of Energy program. They are useful in capturing the energy from different sources and storing them during off-peak hours. This will save on costs and establish various benefits such as a stable source of supply in case of a power outage, establishing a shift away from a central local point of power generation, to a decentralized model. A feasibility study is currently being conducted in areas of interest such as, Central Rift, Coastal Region, Mount Kenya, Nairobi, North Rift and Western Kenya.

Figure showing final design of the green railways to be constructed in Nairobi. Image: Atkins

SIGNED INVESTMENT DEALS

Starting from the recent ones which were signed at the Cooperation of Parties (COP) 28 sidelines in UAE, Kenya has bagged 7 green investment deals which include:

1. $1.5 billion green fertilizer project in collaboration with Fortescue Future Industries (FFI) of Australia.
2. A $1 billion geothermal initiative at Suswa with Indonesia's Pertamina geothermal energy, backed by UAE's Masdar Company. Masdar is known for its involvement in Morocco's Noor Quarzazate Concentrating Solar Panel (CSP) construction.
3. Amea Power of UAE and GDC to invest $800 million in a 200MW Paka geothermal project which will be implemented in phases of 100MW each.
4. United Green and Kenya Development Corp collaborating with Kisumu County on a $270 million sustainable agriculture project spanning 15,000 hectares in the Lake Victoria basin. This climate-smart crop and agro-industrial initiative is expected to create 2000 direct jobs and provide income for 20,000 farmers.
5. $200 million clean Energy Supply Chain (ESC) initiative.
6. UK partnership to complete the Grand High Falls dam which is estimated to generate 1000MW and facilitate irrigation for 400 hectares which will be led by the UK engineering firm, GBK.

PLANNED PROJECTS

1. Geothermal Development Company (GDC) is targeting 100MW electricity generation from the Paka area by the close of 2026.
2. KenGen has received landmark approval to overhaul the Gogo Hydropower redevelopment project situated in River Kuja in the Western Region.
3. GDC is set to supply geothermal steam and brine for Karsan Ramji and Sons Limited to power the company with steam and dry the components of cement.
4. KenGen is launching a 40MW Floatovoltaics project on the Kindaruma Hydropower plant reservoir, financing will be done by the German Development Bank.
5. Kenya is preparing to construct a nuclear power plant by 2027, affirming its commitment to utilizing 100% renewable resources for electricity generation. This 1000MW project is earmarked for Kilifi or Kwale counties and is one of the projects attracting Rolls Royce Holdings PLC.
6. Doubling of the Malindi Solar Farm equipped with battery storage.
7. KenGen is to build a wind farm in Marsabit which will be the second largest in the country after Lake Turkana Wind Farm and is expected to commence in 2026. A French Company has shown interest in funding this project. This is in line with KenGen Company's ambitious plan of injecting 2.5GW into the national grid by 2030.
8. KenGen plan of locally manufacturing Motors and Transformers which will cut their costs and strengthen the Kenyan Shilling by sourcing materials locally.

Figure showing the first ever Floatovoltaics in Kenya located in Rift Valley Rose

In an era dominated by Artificial Intelligence, big data analytics and Machine Learning, various companies are integrating them and renewable sectors have not been left behind. Kenya, standing at the forefront of this digital evolution, has embarked on successful training initiatives in the energy system modelling, leveraging tools like FlexTool and OseMOSYS. These tools, facilitated through a partnership with the Climate Compatible Growth (CCG) program funded by UK Aid, offer crucial insights into investment strategies, technology deployment, and infrastructure development.

There is also success in an Internet of Things (IoT) system developed by Yokogawa for KenGen PLC. This enables integrated remote performance management of power generation performance by detecting problems and maintenance status of related equipment, which will in turn maximize generation efficiency and offer a stable source of power. The centralized monitoring capability eliminates the necessity for physical on-site presence, streamlining operational oversight. There are other areas to explore which can ensure we spearhead the goal of fuelling green industries by 2040, which include Additive Manufacturing (AM) which has been proven to be efficient especially in manufacturing wind turbines on-site to save on transportation costs, creating repair parts for drilling rigs and power plants as seen by the success of Enel Green Power who used AM to produce technical parts for its geothermal power plant.

The investments above and many more are proof that Kenya is headed in the right direction and will achieve beyond its target if it continues in this momentum. The newly launched Accelerated Partnership for Renewables in Africa (APRA) by President William Ruto should help in fast-tracking these projects and introduce many others that will help Kenya improve and aggrandize its economy and currency respectively.

Figure showing an example of BESS batteries. Credit; Mitsubishi Heavy Industries Group

The Damage Fund that was unveiled at COP 28 is also a significant step toward recognizing and addressing the challenges faced by African countries due to climate change despite only contributing a miniscule amount.

There is hope for finances as IRENA acknowledges that Africa indeed does receive only 2% of worldwide investment in renewable energy and mineral potential which hinders the full potential of these projects, and redressing action is needed to ensure equal inclusivity of Africa with other global countries. Other investments in the form of selling carbon credits should introduce various policies that ensure African states are selling their shares at the same price as other global countries to maximize on financial gain. The Damage Fund that was unveiled at COP 28 is also a significant step toward recognizing and addressing the challenges faced by African countries due to climate change despite only contributing a miniscule amount.

The Kenya Geothermal Congress organized by the Geothermal Association of Kenya in July of 2024 is a good place to exchange ideas and interact with local manufacturers to contract and include them in the ongoing ambitious plans of tripling our energy generation capacity, this envisioned expansion in energy output holds the promise of fortifying the Kenyan shilling, signalling positive economic growth and stability.

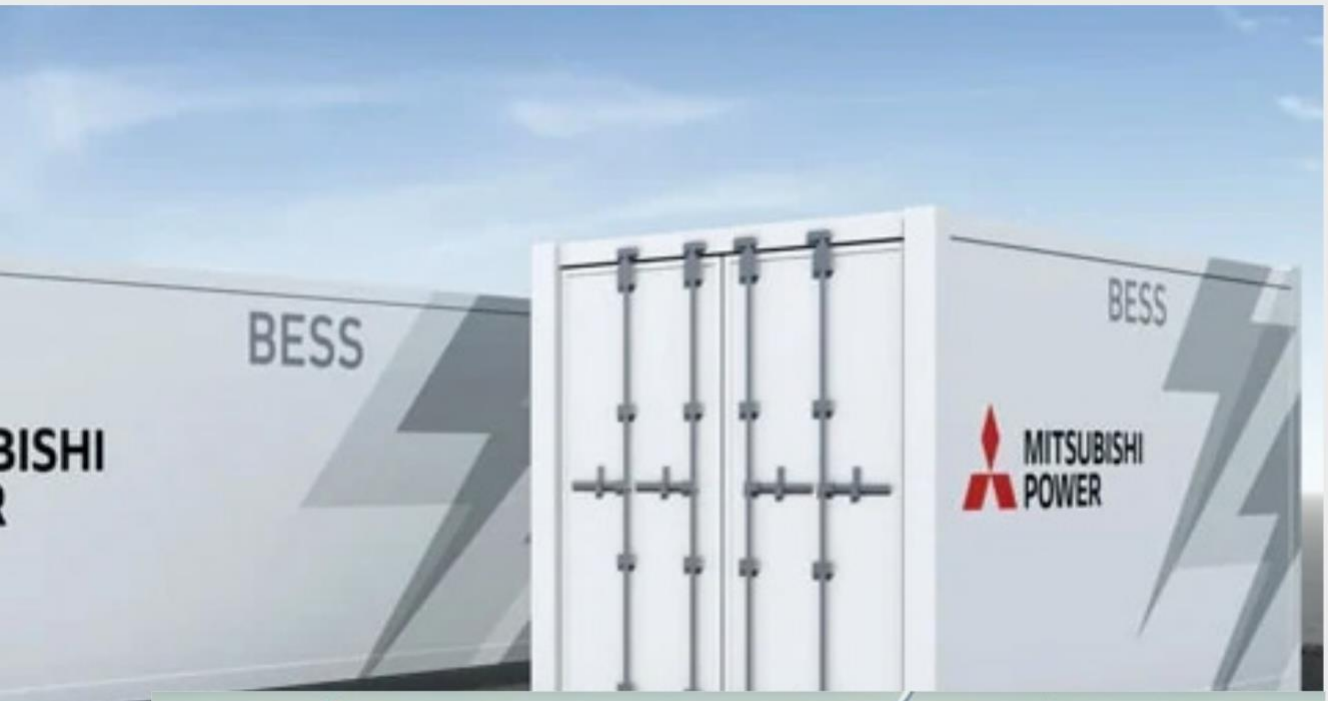


Figure showing map of Kenya with transmission lines powered by green resources. Photo powered by DALLE

Kenya's electricity sector in 2023 in review, and 2024 prognosis

By George Aluru, CEO Electricity Sector Association of Kenya

2023 has been a chequered year for the country and the electricity sector in Kenya. The economy suffered from the continued escalation of prices of fuel, also affecting power generation from thermal plants. The country was also reeling from prolonged drought, carried forward from 2022 that saw a big dip in the production of electricity from hydropower sources and an increase in generation from thermal power plants. Towards the end of the year, this changed to a flooding situation that saw the hydropower dams fill up and produce more. The Kenya shilling experienced a big loss in value against the hard currencies, implying a need for more shillings to meet hard currency obligations. This caused a strain on the ability to honour contractual obligations.

2023 also saw the increase in electricity retail tariffs after a tariff review exercise that had been three years in the making. KPLC was allowed to collect higher rates with a requirement to reduce the power losses experienced on the grid progressively. The increase was necessary to match new obligations, but the utility needs to focus heavily on reducing losses and improving the quality of supply. Peak demand for electricity rose to 2170MW while the installed capacity rose to 3300MW. There was an addition of 35MW from geothermal and 200MW from the Kenya Ethiopia line.

There was a continued push to renegotiate PPA contracts with the aim of lowering the cost of generation. While there is need to lower costs, the approach used increases risk profile and may lead to future higher costs. The national assembly and senate instituted their own enquiry into the cost of power and power sector in general. The former put in place a moratorium on new PPAs just weeks after the previous moratorium placed by the previous government in 2022 had been lifted. These moratoria continue to put the country at risk of a future supply shortfall.

Transmission projects continue to be built, key among them, Turkwel-Ortum-Kitale line, the Kenya Tanzania interconnector and the works at Mariakani substation. These and other lines and substations will prove important to stabilising the grid. These lines would also help reduce the cost of power by allowing cheaper generation to reach stranded loads across the grid.

KPLC, KETRACO, KenGen and GDC got new CEO/MDs, good appointments in my view. The Auditor General in her report on KPLC once again gave a damning view of the state of operations of KPLC for the previous year and recommended improvements in efficiency and general management of the utility. KPLC shareholders towards the end of the year brought on board four directors to represent private shareholders in the board of ten. These four get their mandate directly from private shareholders and are expected to act independently for the interest of the company as opposed to state appointed directors.

The quality of supply issues culminating to three national blackouts in the last quarter of the year brought to fore the challenges of the grid. These have been linked to transmission inadequacies because of underinvestment. As a result, after the last national blackout, it has been announced that West Kenya may endure power rationing for at least the next 20 months.

Nairobi also played host to the Africa Climate Summit that brought together delegates from across the continent to discuss the African position on climate change. The conference ended with a declaration promoting the greening of African industry and renewable energy development. Earlier, the city also hosted the Africa Energy Forum, a meeting of sector stakeholders from across Africa and beyond, focused on power supply. In the year, the Kenya delegation at COP28 also came back with USD 3.5 billion worth of deals for investment in power generation in Kenya, some linked to green hydrogen.

The green hydrogen movement in Kenya gained traction in 2023, culminating in the launching of the green hydrogen strategy and roadmap during the Africa Climate

KPLC will see improved performance in 2024 with the settling in of the new management, more independent board and the effects of higher tariffs, yield of loss reduction strategies and better availability of spares. The consumer price will reduce marginally from current levels, owing to the tariff reduction trajectory in the gazetted three-year tariffs, reduction in fuel prices, completion of some key transmission lines and stabilisation of the Kenya shilling.

Summit and subsequent development of guidelines for green hydrogen development. Green hydrogen projects continue to struggle with the requirement of lower costs of power of less than 3 USD cents/kWh. The strategy and roadmap foresee an initial focus on fertiliser and methanol production for local use, followed by ammonia for export.

At ESAK, we studied the captive power market establishing 430MW of installed capacity installed by industries, lodges, shopping malls and other establishments. Captive power installations have been driven by quality of supply issues, attempts to reduce cost and climate responsive investing by companies. These installations are equivalent to 13% of the power capacity installed on the grid.

Transmission projects continue to be built, key among them, Turkwel-Ortum-Kitale line, the Kenya Tanzania interconnector and the works at Mariakani substation. These and other lines and substations will prove important to stabilising the grid. These lines would also help reduce the cost of power by allowing cheaper generation to reach stranded loads across the grid. The Kenya-Ethiopia line was completed and energised with Kenya receiving up to 200MW from Ethiopia. The line will also enable further power transfers between Ethiopia and Tanzania.

2023 also saw a directive for the country to move in the direction of electricity auctions from the cabinet. Little has however been done in the way of follow up to this directive. Projects that would fall under these auctions as suggested have, however, been announced separately. This has been a continuation of half-hearted measures to explore competitive tendering from the last 7 years.

Expectations for 2024

Next year will likely see a continuation of the progress and issues from 2023. The international prices of fuel indicate a continued reduction in price. This looks to be a continuing trend that will be of benefit in reducing the cost of power from peaking plants. Hydro level will start 2024 on a high, given the ongoing rains. Their sustained highly capacity will depend on how rainfall patterns beyond the short rain season around March will be.

Power supply inadequacies in West Kenya will continue with completion of important transmission lines including the Narok-Bomet line still unlikely by end of 2024. The Muhoroni thermal powerplant will roar back to life to support West Kenya and there will be an increased focus to deliver powerplants in the west. There will be no new build powerplants achieving commercial operation on the grid in 2024. Demand will continue to grow at between 80MW and 120MW with the reserve margin continuing to become thinner.

Pressure on existing PPAs will likely continue from the houses of Parliament with attempts at renegotiation set to continue. There is likely to be some settlement to partially pay PPA obligations in Kenya shillings.

KPLC will see improved performance in 2024 with the settling in of the new management, more independent board and the effects of higher tariffs, yield of loss reduction strategies and better availability of spares. The consumer price will reduce marginally from current levels, owing to the tariff reduction trajectory in the gazetted three-year tariffs, reduction in fuel prices, completion of some key transmission lines and stabilisation of the Kenya shilling.

The captive power market will continue to grow, given the quality of supply issues and climate-responsive investing by companies. Solar will continue to be the main driver of this growth. 2024 will likely see the gazettement of the much-awaited net metering regulations and progress on the electricity bulk supply and open access regulations (wheeling regulations). These are key enablers of investments directed at the captive consumption.

2024 will likely see the commencement of construction on 35MW of Geothermal and battery storage aimed at supporting fluctuations from varying renewable energy sources. 2024 will also see the completion of the Tanzania-Kenya line, Mariakani substation and advanced development of the Ortum-Kitale line.

COP29 in Baku, Azerbaijan will see similar commitment and deals for investment in Kenya's power sector and advancement of the status of the COP28 commitments. I, however, do not foresee any groundbreaking in 2024.

I remain hopeful that the sector will continue to institute necessary policies and stick to prudent and rigorous planning under the least cost development plan.

Navigating the Energy Landscape

with Energy Data Analyst Sammy Jamar
– An Exclusive Interview with The Energy Post

By Paul Kimanzi, Principal Officer – Communication

Embark on a journey through the intricate contours of Africa's energy landscape as Paul Kimanzi, a writer for The Energy Post engages in an exclusive interview with Data Analyst, Sammy Jamar. Join us as we delve into Sammy's insights, navigating the twists and turns of energy trends, renewable initiatives and the transformative power of green energy across the continent.

Paul: ***Who is Sammy Jamar and what sparked your interest in research and energy data analysis?***
Sammy: I am a Mechanical Engineer by profession. My interests in Research and Data Analysis were mainly to fill the gap in energy data for Africa and present the true picture of Africa's energy issues.

Paul: ***Your LinkedIn profile highlights your focus on analysing trends and transformation in the energy sector, specifically tailored to the African continent. Could you elaborate on the key aspects of your work in this context?*** **Sammy:** My work as an Energy Analyst involves gathering data, analyzing and drawing insights that can inform investors and policymakers.

Paul: What is the current status of renewable energy in Africa and how do you see it evolving in the coming years?
Sammy: Africa's access to electricity is about 51%, meaning that over 600 million are in the dark. Africa has installed a renewable energy capacity of over 59GW (about 25% of total energy) against the global total of 3,371GW, representing just 1.8% of the total installed share. During the Africa Climate Summit, it was agreed that installed renewables would reach 300GW by 2030, five times the current capacity. This rate is higher than the tripling of renewables which was agreed in COP28. Africa has 60% of the global solar potential. 40% of the strategic minerals needed for decarbonization are found in Africa. Africa receives just 2% of the total renewable energy funding. The continent has the minerals, and energy resources and only needs finance to achieve its energy goals.

High cost of accessing power through the grid, lack of clear policy framework and good political will and lack of access to clean energy means people will rely on unclean energy sources such as kerosene and biomass which produce fumes, affecting the health and productivity of the population. Lack of access to electricity hampers education progress. Energy poverty disproportionality affects women.

Paul: ***Which gaps exist in energy access across Africa and how do they impact the continent's development?***
Sammy: Urban versus rural divide - over 80% of the urban population is electrified, while only 30% of the rural is electrified due to unreliable power supply from the grid - frequent power outages.
High cost of accessing power through the grid, lack of clear policy framework and good political will and lack of access to clean energy means people will rely on unclean energy sources such as kerosene and biomass which produce fumes, affecting the health and productivity of the population. Lack of access to electricity hampers education progress. Energy poverty disproportionality affects women.

Paul: ***What are the existing gaps hindering the full transition to green energy in Africa?***
Sammy: Lack of policy and regulatory framework. Better policies attract investments. Lack of adequate funding and investment and technological limitations as most of these technologies must be imported.

Paul: What does Africa need to overcome to achieve a complete transition to green energy and what factors contribute to the slow progress in this regard?
Sammy: Africa needs more funding. The will to transition is there, but without capital to finance, it remains a wild dream.

Paul: Do we currently possess reliable data to bridge the existing gaps in the transition to green energy across the continent?
Sammy: Yes, we have enough data right from renewable energy potential, cost of transition to what size of population

needs to be electrified. Many models have been developed to estimate all these dimensions.

Paul: ***Is there a disconnect between the data experts like you have on renewable energy and the clarity of direction that policymakers need to advance the green energy agenda?***

Sammy: Policy focus versus data focus - sometimes the policymakers might have a wide range of considerations including political, social and economic, which might not always align with the data. Sometimes policymakers may not have the technical background to fully understand the data and therefore, will not interpret it well.

Paul: ***Do we currently have a clear direction in the green energy transition in Africa or are there ambiguities that need to be addressed?***

Sammy: Generally, there is a clear direction with the significant investments made so far, commitment to international agreements such as, the Paris Agreement. Challenge lies in policy framework, funding gaps and technological and capacity limitations.

Paul: ***Can 100% green energy support Africa's growing energy demand without relying on thermal power?***

Sammy: Africa has enough renewable energy resources in terms of solar, wind, geothermal and hydropower. Africa has the potential of solar capacity at 10TW, hydro at 350GW, wind at 110GW and geothermal energy sources at 15GW.

Paul: ***How are current power generation efforts meeting the growing demand in Africa and what gaps exist in the balance between demand and supply?***

Sammy: Increased investments in renewables - Regional power pools such as the Kenya-Ethiopia link, Kenya-Uganda, Kenya-Tanzania and Zambia link. Off-grid and mini-grid solar solutions are reaching the rural areas far from the grid.

Paul: ***When do you foresee Africa achieving full electricity connectivity and what are the primary challenges hindering this progress?***

Sammy: This is a bit challenging to project. It will solely rely on how fast Africa will move to electrify its population. Electrification rate must be faster than population growth.

Paul: ***With more companies generating their own power, do you see potential challenges for traditional power generators and suppliers?***

Sammy: This will depend on many other factors such as grid reliability, cost of self-generation and tariff pricing. While the exit means a reduction in energy demand and revenue for the utility provider, it provides an opportunity for them to also develop these plants. Kenya Power had indicated plans to do business with sales of solar panels to households and industries. This way, they can generate more revenue.

Paul: ***In your opinion, do we need more players in power generation or is the focus better placed on power distribution and supply?***

Sammy: In my opinion, both should be prioritized. Any energy produced needs to be evacuated.

Paul: ***What data or strategies do you have for bringing down the cost of power and do you believe the cost of electricity will ever go down?***

Sammy: I believe the cost of electricity will come down as technology matures. It will take time to be felt directly due to currency inflation.

Paul: ***Regarding Electric Vehicles (EVs), especially considering the revenue from fuel taxation in countries like Kenya, do you see a strong political commitment to fully transition to EVs despite potential losses in fuel tax revenue?***

Sammy: The benefits of transitioning outweigh the status quo. Kenya spends over 4 billion dollars per year in fuel imports, with current forex reserves of about 7.6 billion dollars meaning that oil imports alone will consume more than half of the reserve in a year! The cost of air pollution on the environment and the health of people is significantly high. Approximately 2,500 premature deaths (roughly 15% of the total) were attributable to air pollution in Nairobi in 2019 - over 1.1 million premature deaths from air pollution.

Increased investments in renewables - Regional power pools such as the Kenya-Ethiopia link, Kenya-Uganda, Kenya-Tanzania and Zambia link. Off-grid and mini-grid solar solutions are reaching the rural areas far from the grid.

What is Enough Corporate Social Responsibility Projects to a Community?

By Philip Mukusya, Assistant Manager- Community Relations

The other day, we were doing community engagement for a borehole to be drilled close to a power station to provide water for the company and the community. The project, at the border of two sub-Counties, attracted many people from the immediate neighbourhood. Opinion leaders elected and church leaders from the two neighbouring sub-Counties came in big numbers.

I thought the big gathering came to pay homage to the company because it has built schools, roads, water pipelines and other corporate social responsibility projects in the area. The company has also offered both secondary and university scholarships to bright and needy students from the area every year.

An ambulance belonging to the company is always a call away whenever there is an emergency in the villages. Without waiting to be pushed to act, the company gives relief food during drought and offers all necessary assistance to mitigate suffering whenever there are disasters in the communities.

During this public participation, speaker after speaker painted a grotesque picture of our company as that of a rich man who humbles himself when he wants to swindle the poor communities and takes off with the loot, never to be seen again.

A well-orchestrated blamed game was played against the company for all the suffering in the community. All leaders in attendance were equal in the blame game. They made demands and gave conditions to be met before the project was started. Nothing was left to chance. They made it clear that because the company is doing business in their vicinity, they should sit pretty and have everything provided for them.

A lady among the community members was of a different opinion. She stood up and thanked the company for the projects it has done in the area, enumerating them one after another.

Her voice of reason was drowned by shouts from the other community members. She was a woman of substance and not easily intimidated. She stood her ground and told the gathering to thank the company for what it had given them. She said other companies in the area have never done any CSR project, therefore, they should be thankful first before requesting more.

How much can a company do for the community to be appreciated? Most likely there is no measure of what is enough. The best may be to have the communities understand the business of the company. The community should appreciate the vision, mission and mandate of the company. All the company policies which touch on the communities should be subjected to public participation and community input should be given prominence.

A lot comes into play when a community is making demands from a company, politics, socio-economic and cultural factors, among others, inform what communities want. If a community does not appreciate a company which operates within its vicinity, it will deny it social license to operate and cripple it with demands.

During the social survey done at the initial stages of the project, all dynamics of the communities should be established. The corporate at that early stage should determine how to support the community's culture and socio-economic activities so that they remain independent. If the community becomes reliant on the corporate for its sustenance, it will be too heavy for the corporate to support and there will be strained neighbourliness.

There should be frequent stakeholder engagement meetings with the communities aimed at equipping them with the company's vision, mission and more importantly, the Mandate. Such meetings will make the communities interact with the company business and natural boundaries will be drawn and natural laws of interaction will emerge.

In the case of KenGen, the mandate which states 'to generate electricity through development, management and operation of power plants' should be known by the communities. Once they appreciate the corporate mandate, they will make informed requests and there will be good interaction between the corporate and the communities.

The CSR policy subjected to public participation will be a policy owned by both the corporate and the communities. Executing such a policy will be pleasurable because it will be to the exact needs of the society.

Energy CS Reassures Locals on Flood Mitigation Efforts During Eastern Region Tour

By Paul Kimanzi, Principal Officer – Communication

The Cabinet Secretary, Ministry of Energy and Petroleum, Davis Chirchir toured Eastern Region in November 2023 to assess the performance of the hydro dams, where he assured communities residing downstream of the Ministry's commitment to monitoring dam performance and issue timely alerts to prevent potential disasters in the event of spillovers.

Accompanied by Principal Secretary, State Department of Energy, Alex Wachira, Garissa Township Member of Parliament, Hon. Dekow Barrow, KenGen Managing Director and CEO, Eng. Peter Njenga, among other high ranking company officials, Chirchir assured that the rising water levels were being monitored with a possibility of issuing early warning alerts should the water reach alarming levels.

The CS said with more inflows, Masinga Dam was storing huge amounts of water and would soon start generating power after accumulating about 5 billion cubic meters and utilize the water as a mitigation to flooding downstream.

"It is a management strategy, that is why we are not generating. The dam has not been producing electricity due to low levels of water occasioned by prolonged drought. We are actively monitoring the water levels in the dams and keeping daily records to mitigate the possible spilling challenges. We are still safe," the CS said.

He said the cost of electricity would soon go down as KenGen increases electricity generation from hydropower, which is cheaper to generate and more competitively priced. PS Wachira echoed the CS's sentiments.

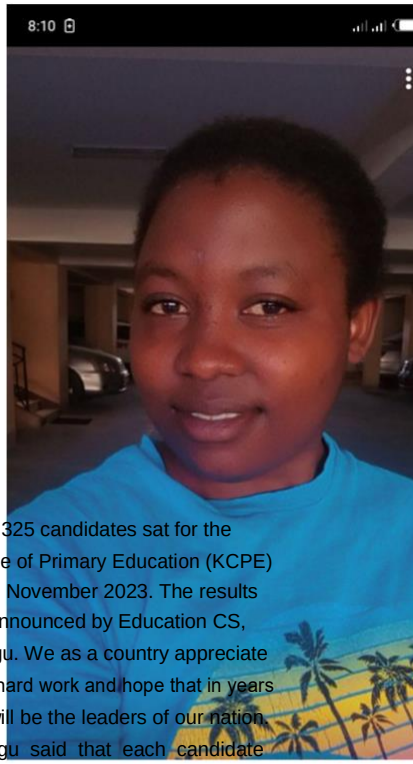
Eng. Njenga, in his remarks, dispelled the longstanding belief that hydro dams contribute to flooding, stating that, on the contrary, dams serve as flood mitigation by holding substantial water volumes and protecting downstream communities.

However, some of the dams such as Kamburu and Kiambere are almost reaching maximum levels. Eng. Njenga urged communities living in Lower Tana to exercise caution due to the potential risks to lives and property in the event of heavy flooding.

In response to accusations, Garissa Township MP, Hon. Barrow absolved KenGen from blame for flooding, stating, "Garissa is already flooded. We had the belief that the water was coming from the dams. We have confirmed the water is coming from the rains."

Form One Placement of the Class That Marked the End of the 8.4.4 System of Education

By Mercy Ngui, Bomet University



A total of 1,415,325 candidates sat for the Kenya Certificate of Primary Education (KCPE) examinations in November 2023. The results were officially announced by Education CS, Ezekiel Machogu. We as a country appreciate the candidates' hard work and hope that in years to come, they will be the leaders of our nation. Ezekiel Machogu said that each candidate will get a place in a secondary school, despite the marks attained. The placement will be conducted fairly, showing love and spreading unity all over the country.

By November 25, the results will be out and parents should prepare their children in advance. Parents are also advised to accept whatever their children scored even if it was below their expectations. Things change and they can improve after joining high school. These children should be treated like any other child. Insulting them may lead to murder cases. Instead, encourage your child that he/she can make it.

I wish the parents all the best as they prepare their children to start the secondary level of education.

Head Office

KenGen Pension Plaza
Address: P. O. Box 47936, 00100, Nairobi
Tel: 0711036000/0732116000/203666000.
Email: Pr@Kengen.Co.Ke

www.kengen.co.ke