GDC, KCB SEAL HOUSING DEAL

LAND LEASE PAVES WAY FOR MENENGAI POWER PLANTS

REFLECTIONS FROM THE HOT SEAT

Steam

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How GDC will power *the* BIG4

Kuwait pledges to support Djibouti geothermal steam

Bridging the divide - GDC to train Africa

Everyday, our engineers and technicians are at work - pulling and pushing in search of geothermal steam that will power our country to prosperity

Steam

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Steam reports on geothermal development in Kenya. It gives readers insights into the great potential that exists in the country and how GDC is developing the resource for national good.

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Geothermal Development Company Limited
Kawi House, South C
P.O. Box 100746-00101 Nairobi
Tel:+254 719 036 000
email: steam@gdc.co.ke www.gdc.co.ke

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It's been a while since we last interacted on this platform. A lot has happened ever since.

Our projects are steaming ahead. In Menengai, Nakuru County, we are crossing the bridge to the next phase of Power Plant construction. GDC has managed to meet all the Conditions Precedent clearing the way for IPPs to set shop.

Menengai's landscape has changed with near-completion of the Steam Gathering System. And we have also gained steam as we seek to support the President's BIG4 agenda. Read our story on how GDC will power food security.

This edition of Steam is as rich as ever with incisive articles and expressive pictures. Relax, read, enjoy.

Eng. Johnson P. Ole Nchoe
Managing Director & CEO

May - July 2018

INSIDE

Step!

GDC KENYA

@ GDCKENYA

How GDC will support the BIG4

"This explains why we are proposing to have industrial parks to be juxtaposed to geothermal power plants."

When H.E. Uhuru Kenyatta, President of the Republic of Kenya pronounced his four key pillars for the next five years – Food Security, Affordable Health Care, Affordable Housing and Manufacturing – at GDC we knew exactly how we fit in the bigger picture.

This is how: geothermal energy will be critical in all the fronts because of its affordability. But critically, geothermal energy will drive the agenda of food security and manufacturing.

GDC is banking on mining heat from steam to support manufacturing and food security.

For instance, two years ago, GDC made history with the first ever-pasteurized milk using geothermal energy at Menengai in Nakuru County. Though at a proto-type level, the unit has proved commercial viability. It uses geothermal steam, instead of wood or oil fuel.

The milk unit is just one of the four innovations under the Power Africa programme. The other exciting innovations include geothermal heated Laundromat, geothermal heated aquatic ponds and geothermal heated greenhouses. All the four prototypes are ready for uptake.

We are also planning to heat greenhouses for horticulture farming and to heat fishponds. Besides, the massive water condensate from power plants will be channeled for irrigation. We have largely earmarked key areas in the Baringo-Silali region, around Menengai Geothermal Project and in the Loita Plains for Irrigation.

Our postulations are that with a vibrant food production environment, food processors will also emerge taking advantage of the raw materials and heat from power plants.

Food processing such as drying of grains and vegetable, milk pasteurization using affordable geothermal heat and technology will save communities a great deal from the pains of post-harvest losses, which is common. That way we are assured of preservation and therefore mitigation against food insecurities.

This explains why we are proposing to have industrial parks to be juxtaposed to our power plants. The industries will utilise the readily available geothermal steam for processing at very competitive rates. They will also benefit from our tariffs, which will be the lowest at US $7 cents per kWh.

I'm of the strongest conviction that our efforts at GDC are going to be a major boost to the BIG4 agenda.

Wanjiru Kan'gara
Manager
Corporate Communications & Marketing

Menengai is on point says AfDB director

Upto there... *Mr. Cornel Ofwona (right) the General Manager, Geothermal Resource Development at GDC draws the attention of Dr. Calleb Nyamajeje during the tour of Menengai Geothermal Project.*

The African Development Bank (AfDB) will continue to finance the Geothermal Development Company (GDC's) quest towards affordable clean energy.

On a review tour of Menengai Geothermal Project recently, the bank's Executive Director for Eastern Africa Region, Dr. Calleb Nyamajeje noted that geothermal energy is the way to go for Kenya. He expressed the bank's commitment towards financing green energy projects.

Dr. Nyamajeje, further congratulated GDC for its efforts towards renewable energy and on cutting the cost of electricity. He commented GDC for coming up with a model that ropes in Independent Power Producers (IPPs) towards geothermal development in Kenya.

"I am happy that IPPs are now ready to put up power plants. That is a major milestone for GDC and AfDB," Dr. Nyamajeje remarked when he visited the Menengai Geothermal Project in Nakuru County.

GDC is currently drilling geothermal steam for power generation in Menengai. GDC Managing Director & CEO, Eng. Johnson Ole Nchoe who was present said that GDC will offer the cheapest tariff of power at 7 US cents per kWh.

The Menengai project is at a critical stage where three Independent Power Producers are now pursuing financial closure with financers to pave way for the construction of power plants that will generate 105 MW.

African Development Bank (AfDB) is a key financier of the Menengai Geothermal Project at cost of $120 million. The financing is for capacity building, purchase of three rigs, and purchase of drilling consumables.

Dr. Nyamajeje noted that Kenya has vast geothermal resources, which are critical to national development. He encouraged GDC to pursue further financing for other projects. GDC is also developing the Baringo-Silali geothermal block, which has an estimated capacity of 3,000MW.

FACTS & FIGURES

$7 cts

Cost of electricity from GDC per kWh. It will be the cheapest tarriff ever.

$120 million

Funding from the African Development Bank (AfDB) for the Menengai Geothermal Project for drilling 120 geothermal wells

105 MW

The amount of electricity that will be generated by three IPPs from Phase I of the Menengai Geothermal Project.

3

No. of IPPs that are set to build power plants for Menengai Phase I

GDC secures fuel for Baringo-Silali operations

DRILLING Operations for Baringo -Silali are shaping up as GDC and the National Oil Corporation of Kenya (NOCK) entered into a fuel supplies agreement.

NOCK will supply GDC with diesel for geothermal drilling operations and to pump water.

The one-year contract runs to April 2019. It comes with a discount of Sh. 4 per liter of diesel.

NOCK Managing Director & CEO Ms. MaryJane Mwangi thanked GDC for the business support.

"We truly appreciate this business support. Our profits go back to all Kenyans and GDC has demonstrated patriotism in this gesture," said Ms. Mwangi.

GDC Managing Director & CEO, Eng. Johnson P. Ole Nchoe notes that the deal will ensure proper supply of fuel to expedite the drilling process for GDC.

"This is a great milestone. The Baringo-Silali Project will now proceed without hitches," he said.

Thank you for your business... *Ms. MaryJane Mwangi (right) the CEO of National Oil Corporation exchange the Oil Supplies MOU with Eng. Johnson P. Ole Nchoe, the MD& CEO of the Geothermal Development Company at Kawi House.*

Solai Dam tragedy: heroic GDC staff save lives

A swift response from GDC medical and security team helped to save some lives when the Patel Dam in Nakuru collapsed on May 11, 2018. The GDC crew was the first responder to the scene soon after receiving distress calls from Energy Village residents.

"I was in the office in Menengai when a call came in at around 9 O'clock. It was about the tragedy. I quickly sought clearance from my seniors, which was granted and off we hit the road to Solai," recalls Ms. Lucy Kiplamai a Clinical Officer at the Menengai Geothermal Project.

GDC dispatched two ambulances complete with a security backup. The team of five worked for seven straight hours from 10:00 pm to 4:00 am. They rescued people, administered first aid and rushed others to hospitals.

"We arrived to a complex ground. The scene was chaotic," recalls Ms. Kiplamai who was also the team leader during the operation. "People screamed others shouted for help… roads were covered with water, mud, tree trunks and boulders, but we were determined to save lives," she says.

Ms. Kiplamai is a veteran in disaster response. She handled the 2007 post-election violence and the Sachangwan fire tragedy on Nakuru-Eldoret Highway. Her counterpart Ms. Dorcas Wankuru, an Emergency Medical Technician based in Menengai, had handled rescue operations of a collapsed building.

"In a rescue operation you cannot save everyone but always you have to stretch beyond your limits," noted Ms. Wankuru. "I'm grateful that amid the challenges we saved some lives," said Wankuru. "That is what rapid responses means. You must be ever alert."

And this gesture of compassion and bravery did not go unnoticed. Central Rift Regional Manager Mr. Paul Ngugi hosted the crew at his office and congratulated them for the gesture of selflessness and service to humanity.

"As a company we are very proud of you. You went out of normal duty to rescue lives. That's commendable. Such is the strong spirit that GDC embodies," said Mr. Ngugi.

Land lease, steam report clears way for Menengai power plants

The Geothermal Development Company (GDC) quest for establishing geothermal power plants in Menengai, Nakuru County got a major boost after it finally obtained a Land Lease Deed from the Kenya Forest Service (KFS).

The lease now clears way for the construction of power plants for the Menengai Phase I project which will produce 105MW. The land will also serve subsequent power plants at the Menengai Crater.

"This is a big milestone for us," enthused Eng. Johnson P. Ole Nchoe, the GDC Managing Director and CEO. "The land lease was one of the Condition Precedents for the 105 MW power project to take off. It was a major bottleneck. We are happy to have crossed that hurdle," he noted.

Independent Power Producers (IPPs) required the land lease in order to commence the construction of power plants. The three IPPs namely Sosian, Quantum Power and QPEA GT Menengai will each generate 35 MW totalling 105 MW. GDC is also expanding its drilling operation for other phases in Menengai.

"We have made major progress in the unlocking of the 105 MW project. Now GDC has met all the critical Condition Precedents and we're steadily on course to generate power from Menengai," the Eng. Ole Nchoe said with optimism.

The CEO noted that affordable, reliable and clean energy is critical to drive the national economic agenda. He explained that the Menengai 105 MW project will be a big boost to the grid.

Here's the report... ***Eng. Johnson P. Ole Nchoe, the Managing Director and CEO of GDC (left) hands over a copy of the 'Steam Report' to Ms. Colleta Suda, the CAS Ministry of Energy. (MOE) At the background, from left, Dr. Eng. Joseph Njoroge, PS MOE, Enrique Lima (Team Leader West JEC) and Hon. Charles Keter, the Cabinet Secretary MOE, peruse through the report at Nyayo House.***

Initial requirements to the construction of power plants, known as Condition Precedents (CPs) have been dully fulfilled by GDC.

Another key condition was a Steam Report – this is an independent assessment of the availability of steam JICA supported GDC by hiring an independent consultant, West Jec, of Japan to carry out the study. Recently, West Jec released the report to GDC, Ministry of Energy and IPPs. The report demonstrated that Menengai, so far, has enough steam for 105 MW plus 20% extra.

GDC has also made major strides in the construction of a Steam Gathering System, which is 95% complete. The 25 KM long pipeline can carry steam capacity of 150 MW.

FACTS & FIGURES

4,000

Number of acres that GDC has leased from KFS for the Menengai Geothermal Power Project

20%

Extra amount of steam at Menengai that GDC has at its disposal currently for the Phase I 105 MW Project

40

Number of years that GDC has leased the Menengai land from KFS.

Baringo Governor hails GDC's progress

Mr. John Lagat *(left)* the GDC Regional Manager, North Rift and Baringo Governor H.E Hon. Stanley Kiptis hold aloft a map showing where the geothermal operations in Baringo will take place. The Governor who had paid a courtesy call to the Managing Director & CEO Eng. Johnson P. Ole Nchoe at Kawi House, said that collaboration and partnership will realize faster development in the region.

"I'm happy with the relationship that the County and GDC are enjoying. We need to firm it further and even explore new areas of collaboration," the governor noted.

"Even the idea of distributing water to the community is quite unique. We are all looking forward to the water which will change the way our people live," an elated Hon. Kiptis said.

GDC is set to develop 300 MW from the Baringo-Silali block by 2030. As part of the CSR programme, the Company is distributing water to the community through trucks. But the bigger clincher is in the piped water that will be provided to communities once the supply system is complete.

Nakuru County banks on geothermal to heat growth

"Dr. Korir was excited to learn that geothermal heat is very effective in drying of pyrethrum."

Development of geothermal energy at Menengai will play a critical role in the growth of Nakuru town and its suburbs, the Nakuru County Deputy Governor, H.E. Dr. Eric Korir reckons.

Geothermal, Dr. Korir noted will be at the heart of industrial expansion. He pledged the county's support to GDC, which is harnessing geothermal energy for power generation.

"Menengai Project is key in transforming lives in Nakuru. We have seen the social economic development through GDC's robust Corporate Social Responsibility (CSR) programme, but more will come once the project is complete," said Dr. Korir.

The company has worked closely with communities flanking the project area. GDC has been key in the provision of water, relief food and employment. Through the social afforestation programme, GDC has offered tens of thousands of tree seedlings to communities; a strategy that has increased tree cover in the area.

Currently, GDC is working on modalities of setting up an industrial park next to the Menengai Geothermal Project. The industrial park will access cheap power from GDC as well as cheap hot steam for industrial heating.

Dr. Korir was excited to learn that geothermal heat is very effective in drying of pyrethrum. The Nakuru County is reviving the pyrethrum sector and will greatly benefit from the research that GDC is carrying out on the use of hot geothermal steam to dry farm produce.

Elsewhere, the Nakuru County Chief of Staff, Mr. Njoroge Gichuhi, has commended GDCs progress at the Menengai Geothermal Project saying it will hugely support the implementation of the Big4 agenda.

Recently, while touring Menengai, Mr. Gichuhi noted that every aspect of economic development has an energy component.

"As a country we can hardly do much without energy," Mr. Gichuhi told the press at Menengai. "That is why we are proud of GDC's investment here. This energy will transform Nakuru County in a big way," he observed.

GDC, KCB seal housing deal

GDC staff will now access housing mortgages from the Kenya Commercial Bank (KCB) after the two companies sealed a lending deal recently.

"This facility we're signing today will enable GDC employees to access affordable mortgage financing from KCB at affordable rates for a maximum of 20 years," said KCB Group Chief Operations Officer Mr. Sam Makome.

GDC's General Manager, Human Resource & Administration Mr. Simon Kiplang'at noted that the mortgage scheme now augments the GDC welfare portfolio.

"Today marks a significant journey for GDC. This facility has since been endorsed by the GDC Board of Directors and it's very dynamic," Mr. Kiplangat said during the signing ceremony.

At 3%, the mortgage is one of the most competitive in the country.

"The KCB partnership with GDC demonstrates commitment to the country's housing sector through the Public Private Partnership model, to reduce the acute housing deficit," Makome said.

The mortgage news received accolades from GDC staff. "It's a great milestone. It's the dream of every employee to own a house. A mortgage scheme like this one is most welcome because most employees would not have the ready cash to finance their housing," noted Solomon Sankaire an accountant.

Apart from the mortgage, GDC staff are also entitled to car loans.

3%

The interest that GDC staff will pay for the mortgage.

Kuwait pledges to support Djibouti geothermal steam

By The Numbers

27

The loan in Millions of US Dollars that Djibouti has received for geothermal development from Kuwait Fund.

15

Number of megawatts to be generated following the loan agreement

25

Number of years that the loan will be repaid.

Djibouti will soon join the league of geothermal energy after the Kuwait Fund extended a loan of $27 million to finance a 15MW power plant.

The loan will finance the drilling of about 10 wells for the production of steam and reclaimed water re-injection and the construction of a 15 MW power station at Jalla Koma (Phase I), 120 km west of the capital, Djibouti.

The geothermal power project aims to contribute to Djibouti's electricity base, reduce the interruption of electricity services and reduce the import of fuel and electricity. The project also aims to protect the environment from contaminants from thermal stations that uses fossil fuels.

Further, an agreement (Project Agreement), concerning arrangements for implementation of the Project, was also signed between Kuwait Fund for Arab Economic Development and Djibouti Geothermal Power Corporation which is undertaking the geothermal Project.

The main components of the project are: Steam production facilities, elecricity generation and consulting service.

Steam Production Facilities

1. Infrastructure development such as construction of roads leading to the site of the project and water reticulation systems.

2. Supply, work and testing necessary to drill about 10 wells at depths ranging from 600 to 1200 meters, including eight steam production wells and two water injection wells with all necessary connections, equipment and devices.

3. Supplying and installing water transfer pipes from condensers and injection pumps with all their accessories from joints and valves.

4. Supply, installation and testing of steam separators with all their basic requirements.

Electricity Generation Facilities

Including the supply, installation and testing of 3 units of power generation each of about 5 MW with the necessary requirements to connect the station to the electrical network, spare parts and all the necessary mechanical and electrical supplements, civil works and control system and measurement.

Consulting Services

Including the preparation of tender documents, assistance in the analysis of bids, supervision of the implementation of the project, participation in the tests in the country of the factory and preparation of training programs to develop the capacity of local cadres. It also includes preparing the study of the environmental and social benefits of the project.

Project implementation is expected to be completed by the end of 2021.

The 25-year loan also includes a grace period of 5 years, and is to be amortized in 40 semi-annual installments. The Loan bears an interest rate at 2% per annum, in addition to 0.5% per annum to cover administrative costs and other expenses incurred in the implementation of the Loan Agreement.

Kenya has been a great inspiration to Djibouti's geothermal endeavors. In April 2018, the Djibouti's President, H.E Ismail Guelleh, toured Kenya's geothermal projects. During the tours, Kenya's Cabinet Secretary, Ministry of Energy, Hon. Charles Keter reaffirmed Kenya's commitment to provide geothermal technical support to Djibouti.

Here's my point... *the Djibouti President, H.E. Ismail Guelleh shares a point with Hon. Charles Keter, Kenya's Cabinet Secretary in the Min. of Energy.*

Bolts and nuts... *workers putting the final touches on a section of the Steam Gathering System, in Menengai, Nakuru County. This pipeline is a critical component of a geothermal power project.*

The making of Menengai's Steam Gathering System

By Fouby Akinyi and Godffrey Olali

The gigantic architectural master-piece and conduit-like green pipeline dwarfs Engineer Arcadius Angalwa who quickly squeezes his way out amid scotching heat at the Menengai Geothermal Project.

Eng. Angalwa who works at the Geothermal Resource Management (GRM) department, conducts a daily routine check-up on the ongoing construction of the Steam Gathering System – a sophisticated mega piping system effectively expected to carry at least 1,200 tons of geothermal steam per hour – a capacity which is in excess the amount of steam needed for the 105MW Phase I Project.

The Construction of the Steam Gathering System (SGS) at the Menengai Geothermal Project in Nakuru County is on-going in preparation for the first 105 MW power plants. The system will act as the link between the well and the turbine hence a high level of sophistication in structural design.

On this field day, workers from H Young & Company contracted for the job- are also on site to build the network of pipes which will collect geothermal steam from different wells and channel them to the power plants.

Steam Gathering System is a critical step in any geothermal project. Already, the constsruction of a control room is nearly complete. Three Independent Power Producers (IPPs); QPEA GT

Menengai Limited (QPEA), Sosian Menengai Geothermal Power Limited (SMGPL) and Orpower 22 Limited are expected to construct the 105MW plants with each IPP delivering 35MW. The three have already identified locations to construct the power plants.

For this system, GDC has applied modern technology which will have many separator stations capable of collecting steam from many wells. The design, according to Angalwa, will allow for separation at the wells allowing for maximum control of the process. With this technology, a technician can shut one well as the rest continue to feed the pipes. This is the most popular model.

"This model, also known as centripedal, will really assist GDC in saving time and cutting costs. It will allow for other wells to continue supplying steam even if you continue maintaining others. If you shut a well hence denying a power producer consistent steam supply, then as a steam supplier you risk paying hefty penalties for that," he says.

The engineer adds that what will come out of the well is a two-phase fluid - steam and brine. This eventually is channeled to a separator, which later separates steam and brine.

"Our technology is one of the best. If all goes well, we won't have persistent power problems. Africa is looking into Kenya with optimism because the county is the geothermal belt and we have a lot of potential," he quips with his eyes focused on the steam pipeline.

Indeed, the global economy is now focusing on the robust opportunities in Africa and emerging geothermal markets like Kenya. Africa has strong partnerships and strong markets remain attractive to investors who have interest in new businesses in the region.

For many developing countries, geothermal has the potential to contribute clean, reliable, locally-sourced power that can expand access to electricity, grow the economy, create jobs, and boost prosperity.

> *With this, the IPPs will never be down at any time for lack of steam*

With proper maintenance of the system, the regional geothermal outlook remians impressive. According to Angalwa, the general life-span of steam gathering pipes can last for more than 25 years.

He adds that a total of 13 wells will feed the pipes for the first 105MW while the 60MW phase will also need another steam gathering process.

"But this depends on the amount of steam the Independent Power Producers (IPPs) will need. With time, we will add more wells and this is why it is critical to maintain the wells. At GDC, we use new technology while our separator is one of the best," he says adding that the valves are motorized and the current steam gathering pipes will be capable of delivering to the three IPPs.

With this, the IPPs will never be down at any time for lack of steam. Hence power will be guaranteed always as the country gears towards industrialization phase.

At the end of the steam gathering, there will be steam header, which is a gigantic hollow piping system which allows for IPPs to be able to collect the steam and effectively channel it to the turbine for use.

The process also has a vent station which is a control measure of excess steam which is done by steam field operator and maintenance crew. There will also be a control room between GDC and the IPPs.

"The control room is where all the control mechanisms and the measurements will be done on a daily basis, consolidated and then sent for deliberations. This control room is also linked to the IPPs with a central communication area for monitoring," Angalwa concludes.

A loop section of the Steam Gathering System at the Menengai Geothermal Project. The loop is designed to afford animals easy mobility

GDC administrator memoirs

BY EVANS MUTAI

It's a Friday morning, birds are chirping gaily to usher in the new day in Naivasha. Though chilly – the town is chilly this morning, but in contrast, our guest, Mr. Daniel Ntoipaye Kilelu is warm and lively.

Mr. Kilelu is a man of many hats. He is the GDC's Administrator for South Rift Office and doubles up as the Community Liaison Officer for the South Rift Region. It is in his community engagement work that Kilelu's true element as a negotiator and a

Cont'd Pg. 15

GDC engaging in community relations

community mobiliser blossomed.

Born in a family of five, Kilelu is the second born, and the only in his family who attended school. Insufficient educational facilities, the unfavorable topography coupled with cultural demands crippled the desire for education among his siblings and majority of his peers.

That however did not stop Kilelu from charting a different path from his peers. He enrolled at Olgumi Primary School in Narok County and progressed to Enoomatasiani Secondary School in the same county for his O-levels.

The quest for education saw him trek to and from school for over 24 kilometers. Back then, Olgumi primary school, had a single tutor who taught both the lower and upper primary. Subsequently, pupils attended the lessons in shifts.

24

the number of kilometers the quest for education saw him trek during his primary days.

"We would go for classes from 8am to 12pm for the lower primary and noon to 4pm for the upper primary," quips Kilelu.

These challenges led a number of his classmates to drop out. Many opted to follow the more familiar path of Moranism, but that was not the road that Kilelu planned to tread.

As the great Indian author and motivational speaker Dr. Sanjiv Chopra said: "The search for happiness transcends age, gender, geography, vocation, and personal circumstances" Kilelu who is now a holder of a Masters degree in Human Resources Management, Bachelors of Sciences degree in Agriculture Education and Extension, as well as a Diploma in Education Science did not let the numerous hurdles blight his future.

He ran many miles to school and worked tirelessly towards ensuring that he received the necessary education paving way for a bright future and ultimately reaping the well deserved fruits.

He has played a key role in ensuring that GDC is accepted in its areas of operations in the Suswa area in Narok County. He has been at the forefront in the establishment of harmonious relationships between the Suswa stakeholders and GDC, thereby ensuring that GDC operations within the area kick off without any major hindrances.

He together with his community relations team traversed the rugged terrain of Mt. Suswa, holding barazas (community meetings) here, participating in a community project there, all in an attempt to persuade the resident community into realizing the gains that come along with the development of geothermal resources in the area.

"At first, the reception was not warm, but after several fruitful meetings, we managed to demystify most of the claims and reservations that the community held," he says.

Myths such as geothermal energy causing infertility amongst women were deciphered. At one point, Kilelu invited several GDC women scientists and drillers to a stakeholders meeting, just to demonstrate to the community that there were women who work in a geothermal field and had not been affected by such claim.

Mt. Suswa or 'Oldoinyo Lenkai' as is referred to by the locals means a Mountain of God. It is here that several spiritual and religious shrines are found. It is also known to be a source of the red ochre, 'Oldoinyo onyokie' that the Maasai Morans apply on their heads. "I remember attending a meeting and one prophet from the community said that if we drilled the area, we would awaken the God's wrath. Being a leader in the community, the residnts believed him and they were no longer afraid of "the explosion which would consume them if they ever allowed us to drill," he says.

"We however managed to convince them that we were going to preserve the religious sites and it is only then that they gave us a go ahead for our activities in the area," notes Mr. Kilelu.

It is these cultural and spiritual attachments that initially made the Suswa area, rich in estimated 300 MW of geothermal energy, a hard nut to crack. But voila! In came Mr. Kilelu.

Armed with critical negotiations skills gained throughout his vast experience in dealing with the community issues, his knowledge and understanding of the geopolitical, social and cultural aspects of the Suswa area, Kilelu and the GDC team made sure that myths were debunked thus paving the way for GDC scientists to scour the area for geothermal resource.

For the career educationist, these achievements have not come without its share of challenges, the huge demands from the community for employment coupled with budgetary constraints have seen him work extremely hard in an attempt to convince the stakeholders to embrace GDC's viewpoint on several fronts. He adds that he is committed to ensuring that the established rapport between the stakeholders and GDC remains, even as the company works towards beginning drilling in the Suswa area.

They say that the two most important days of your life are the day you are born and the day you find out why. Well, Kilelu seems to have found out his 'Why' and that is to play the role of an arbitrator in forging lasting relations between GDC and its stakeholders.

Kilelu during one of GDC's community engagement forums in the Suswa Geothermal Project Area

Geothermal key enabler for manufacturing

Kifaru, a titanic assemblage of an engineering structure (called the drilling rig) for boring the earth, sits appropriately on the floor of Menengai – a huge crater created by volcanic eruption in Kenya thousands of years ago.

The *Kifaru* is in search of superheated subterranean steam for power generation. Its bit is chewing its way up to about 3,000 meters deep. It is around this depth that huge reservoir of semi-gaseous steam is capsuled

From the belly of this jagged world, the steam will gush to surface under high pressure and channelled to turbines to generate electricity.

"We've hit the production section," enthuses Stephen Kangogo, an engineer in charge of drilling operations here. "The well is promising. It's likely to yield substantial steam."

Kenya is turning to steam power to drive national development. The Geothermal Development Company (GDC), fully-owned by the state, is zealously leading the charm offensive towards a bountiful power production.

"At Menengai we already have steam enough for 105MW," Kangogo quips "We're searching for more," he says.

The 105 MW of steam will be sold to IPPs who will use it to generate electricity. One such IPP is Quantum

Kenya needs this energy and more that GDC is set to produce. The country is betting on such affordable power to drive manufacturing which is one of the four key pillars of the government's focus for the next five years.

Geothermal is highly competitive. And GDC offers the best steam tariff ever of 2$cents per kWh to IPPs. IPPs will generate the electricity and sell to Kenya Power at 7 $cents per kWh.

And the Managing Director & CEO Eng. Johnson P. Ole Nchoe is upbeat.

"Indeed, only geothermal energy can offer a tariff of 7 $cents. This is good news to investors because it cuts down on the cost of doing business," he says.

Cheap, reliable power is a key pre-requisite to a vibrant manufacturing regime. So far, it is only geothermal energy that will offer this discount. The electricity from geothermal is cheap. That is not enough, by mining geothermal heat, manufacturers will dramatically cut the cost of wood fuel or oil to heat their boilers for industrial processes. *(see separate story on Direct Uses)*

Energy is also a key actor in determining inflation. The commitment to reduce the appetite on hydrocarbon to steam power is the finest masterstroke ever for this country.

And engineers, scientists and technicians here are unrelenting. Clad in blue overalls and hard hats, the *Kifaru* site is a frenzy of activities- others push perforated casings up the catwalk, others collect samples of cuttings from the well for lab analysis others oil and grease and weld…

Menengai is now on the cusp of power production. The ground is set for IPPs to set shop. Recently, GDC acquired a land lease of 40 years from the Kenya Forestry Service (KFS) for the Menengia power project.

The deed was a critical prerequisite for the IPPs to seek financing. It is also an important facility to ensure that the power plants' 25 years will run interrupted. Indeed, at press time, one IPP, Quantum Power East Africa had its ESIA complete. The ESIA will now pave way for financial closure and for construction of power plants.

Away from Menengai, GDC is also tackling the Baringo-Silali terrain with zeal. In this block, GDC is set to generate 300 MW in the next 10 years. The road network, which is a key infrastructure component in any geothermal operation, is complete. An elaborate water reticulation system is on the making too.

Baringo is an expansive prospect with an estimated 3,000 MW of steam potential. When this power is harnessed, it will change the look of the region as is of the country.

Here too, GDC has geared up towards establishment of an industrial park as well as setting vast swathes of land for irrigation using the water condensate from power plants.

- Eric Wamanji

GDC envisions powering food security in Kenya

By Eric Wamanji

In April this year, farmers in Laikipia, a county which is 300 kilometres from Nairobi, were fretful and frustrated as they watched their tomatoes go to waste due to inadequate market. That's what glut does to farmers. The news of a perishable produce rotting in farms led to heavy discussions on social media.

Post-harvest food waste is a concern world over. Recently, the Kenya Bureau of Statistics (KNBS) reported that Kenya loses a staggering Ksh 130 billion to food waste. This frustrates food security and nutrition efforts. Nonetheless, it is envisioned that the situation will change a great deal once the Geothermal Development Company (GDC) rolls out its elaborate infrastructure, which will use geothermal heat to preserve food produce, which includes tomatoes.

And this strategy perfectly fits into the national Big4 agenda, as food security is one of the key pillars. Climate changes demand smart technological approaches towards food production

Cont'd on Pg. 18

and processing. And that is how GDC futuristic contribution is set to make an incredible difference.

And the place where this game-changer innovation is shaping up is at the Menengai Geothermal Project in Nakuru County. Here, GDC has been aggressively incubating ideas on how to extract heat from geothermal steam. This model, where the heat of the steam is utilized is called direct uses.

GDC carried out extensive research on direct utilization of geothermal energy in Menengai. With the support of Power Africa and USAID, four projects have been piloted. The projects use heat from geothermal steam (not electricity) to heat greenhouses, heat a fishpond, pasteurise and it is also used in a Laundromat.

Menengai is a citadel of holistic utilistation of geothermal. It is here that Kenya's future industrial valley is rising, and GDC is bullish about it.

Greenhouses are terrific for growing fruits and vegetables. Heated greenhouses control fungi development thus reducing the cost of production. Carbon dioxide is also extracted from geothermal and accelerates the process of photosynthesis thus accelerates growth of crops.

"We experimented with tomatoes and capsicum. The results are impressive. This is what farmers need to make a profit and increase production of quality vegetables and fruits," enthuses Ms. Martha Mburu, the Direct Uses Manager at GDC.

Glut does not only affect vegetables and fruits. It also affects milk. Geothermal will offer a solution to glut. The GDC geothermal model in Menengai, the first in Africa, has shown that geothermal reduces the cost of pasteurization by 7%. Investors will find this a lucrative area to venture into as opposed to the current scenario where diesel is used to heat boilers in order to produce steam which is then used to pasteurize the milk.

Undoubtedly, geothermal will save this country a fortune on money spent in importing heavy oil. It will also save on the use of wood fuel, which is an alternative to oil for heating boilers.

A section of the geothermal heated dairy unit at Menengai. Affordable milk pastuerisation will go along way in forestalling milk losses.

"A maize drier using hot geothermal fluid instead of diesel will be a terrific game-changer.

Ms Mburu, one of the few expert in Direct Use of geothermal in Kenya affirmatively asserts that "There is more to food security,".

This year, GDC anticipates to receive the first ever semi-commercial drier that uses geothermal heat to dry grains. Through a grant from Icelandic International Development Agency (ICEIDA) the drier will have the capacity to dry about 20 tons of grains in a day. Once such driers are adopted, it will help in reducing the perennial challenges of post-harvest losses due to inaccessible professional services in drying cereals.

"It's also going to cut the cost of drying by 65 %," Ms. Mburu says. "We're all looking forward to installing it."

A maize drier using hot geothermal fluid as opposed to diesel will be a game-changer. Saving costs and conserving the environment is every investor's desire. And for a country that loses tonnes of grains due to poor drying, this is a perfect solution.

Nakuru, which lies on one of Kenya's maize and wheat belt, the a strategic location where the drier will be installed.

"We want to reduce the use of diesel to heat for industrial purposes. This way we will not only be saving the environment from pollutants, we shall also be reducing the cost of doing business," Ms. Mburu explains.

What works best is an industrial park. And GDC is working on the feasibility that will give Kenya its first geothermal industrial park. Iceland has blazed the trail on this with very positive results.

The GDC Managing Director & CEO Eng. Johnson Ole Nchoe is ecstatic about direct uses. In April, this year he gave an insightful presentation on how GDC is charting the path for a geothermal revolution.

The CEO notes, for instance, that the company is seeking to extrapolate the prototypes at Menengai inviting private investors to the direct utilization economy.

Ms. Martha Mburu, Manager, Direct Uses at GDC hands capcicum to an interested investor who had visited the geothermal heated green house at Menengai.

Once the private money is roped into direct uses, it will give the economy a much-needed jolt.

"The complex will create employment and help the country to save a lot of money that would have been used to import diesel," the CEO says.

"We are committed to the diversification of geothermal energy especially towards food production and manufacturing," says Eng. Johnson P. Ole Nchoe, the Managing Director and CEO.

"Ordinarily driers use oil-heated boilers. Yet, oil is punitively expensive. It has to be imported and transported. But geothermal heating technology cuts the cost of drying grains by about 65 % instead of using industrial diesel oil (IDO) or furnace oil (HFO)," the CEO wrote in one of the dailies.

The condensate (water from steam) is a huge favourite tipped to reshape farming designs along the Rift Valley.

It is estimated that for every megawatt, so much tons of water condensate is also produced. Water is a prized commodity in most areas that receive low rains such as Baringo Silali or Loita Plains.

"Our plan is to use that water and irrigate over 1000 hectares of land in the next 10 years. The irrigation will target pastureland for cattle and for food production," enthuses the CEO.

Irrigation will thus play pivotal role in production and with the convergence of electricity and steam, then the region will remain attractive to agro-processors.

The World Bank for instance has suggested that climate change will disrupt the lifestyles of most people especially those in the arid and semi arid worlds. That is why geothermal will be critical to cushion such communities.

GDC's collaboration with County Governments is also very critical. The counties need to be active participants in this journey which will propel Kenya's of the economic development. GDC, through the ingenuity at its disposal is on the path to change how Kenya generates wealth through geothermal.

Geothermal will give Kenya more water to irrigate land and at the same time support processing of food produce. In future, farmers across Kenya will have a reason to smile as GDC is set to make a huge impact in the agriculture sector.

> *"Our plan is to use that water and irrigate over 1,000 hectares of land in the next 10 years.*

FACTS & FIGURES

Irrigation

GDC will provide condensate from power plants for irrigation to communities which are next to geothermal projects.

Fish farming

Geothermal heat will be used to heat fish ponds thus accelarate the growth of tilapia by a third. Fish ponds are planned for all the areas where there is geothermal resource.

Grain drying

GDC will suppor the use of geothermal steam to dry grains thus cutting cost and reducing post-harvest waste. The first semi-commercial drier to be installed in Nakuru by the end of 2018.

Heating green houses

Green house heating for growing of fruits and vegetables is a great game-changer. At Menengai, GDC has demonstrated that farmers save about 40% of production cost if they use this method.

Milk Pastuerisation

GDC will support large and mid-sized milk pastuerisation using geothermal steam. The prototype in Menengai has proved commercial viability of the concept.

Fred Mayoga, technician at GDC, explains a point to international students at a past training session. GDC is offering its expertise and facilities to train more geothermal experts in the region.

Bridging the divide

ERIC WAMANJI *offers a sneak preview of GDC's efforts towards building Africa's capacity on geothermal technology*

The Geothermal Development Company (GDC) will play a pivotal role in catapulting Africa into a geothermal powerhouse.

Through the Geothermal Centre of Excellence (GCE) GDC is rolling out a series of training modules on geothermal technology targeting countries that are mainly in the East Africa Rift System (EARS). Thirteen countries lie on Great Rift Valley, Africa's geothermal belt. Kenya is leading in the utilization of the geothermal resource. This accomplishment has also elevated Kenya to the ninth position on the global list of geothermal producing countries.

Notably, a skills-gap analysis in geothermal technology carried out in the region identified huge gaps. The GCE will address the gap. The Geothermal Training Institute is a South-South solution-based for the green energy needs in Africa.

Kenya is now strategically leveraging on geothermal energy to augment her status in the region and globally. Kenya is a model to Africa, as Iceland is a model to the world in as far as geothermal related accomplishments are concerned.

"Our principal concern is to empower Africa with the skills that will spur the growth of geothermal in the region," says Dr. George Muia, the General Manager of Strategy, Research & Innovation at GDC. He is based at Kawi House office in Nairobi's.

The GCE has charmed the region if requests for training are anything to go by. "We are receiving many inquiries across Africa. They want to come and train with us," says Dr. Muia.

On this chilly April day, Dr.

Muia is reviewing quotations for training, responding to international queries and directing his team on the next move. So far, the team has received a deluge of requests for training from Djibouti, Rwanda, Tanzania and Ethiopia.

On this day, Dr. Muia is finalizing on the logistics to host 22 students from 11 African Countries who will be training in Kenya beginning May 2018.

"This is a big number," Dr. Muia offers, almost in disbelief. "If we continue like this, Africa will make major leaps in geothermal development."

Most of Africa still grapples with expensive electricity. Like Kenya, their hydro platforms are wobbly due to climatic changes. Thus, these countries desire to use steam to power their economies.

The courses range from geothermal drilling technology to geothermal resource assessment. Training for level one will be running for 21 days; level two 24 days and level three for 45 days.

"In Kenya the geothermal tradition is well established; it spans decades. We have a lot to offer our brothers on the continent," says Dr. Robert Ogutu the Ag. Deputy Manager in charge of GCE at GDC.

Dr. Ogutu asserts that GDC is the regional gateway to geothermal greatness. He is also optimistic that the region will experience an economic boom, when more countries venture in to geothermal energy. Affordable and clean energy like geothermal, he reckons, and righty so, is the ultimate game-changer that unshackles countries from under development.

Conservative estimates put the geothermal potential in the East Africa Rift System at 23, 000 MWs. This is mindboggling by every measure. It explains why countries are angling for the right skills to exploit the trove.

Geothermal development is specialized and complex. It is a convergence of a diversity of geo-sciences and engineering. Projects demand for strong leadership complete with supreme intellectual rigor to pull through, not to mention a financial war chest to boot.

The biggest obstacle to unlocking the massive potential has been human capital. But not any more, now that the GCE is operational. An augmented technical capacity will boost power production from geothermal resources in the region turning it into an attractive destination for investment.

GDC has laid a robust infrastructure for training with elaborate facilities including a rig simulator and seismic equipment. It is also home to some of the best geothermal experts on the content.

Kenya chose the path of geothermal development in response to erratic weather patterns that largely affect hydropower. Furthermore, room to engage in huge hydro infrastructure projects is largely constrained- hydro consumes consumers large swathes of land, affects settlements and forests therefore untenable.

That is why the Government of Kenya established GDC as the ultimate geothermal company, a panacea to power challenges. Now GDC is graciously extending a gift to Africa through trainings.

Dr. George Muia, General Strategy, Research & Innovation

Kenya has also made tremendous strides in developing robust policies, statutes and geothermal development models that the region can learn from. In Kenya, both the government and the private sector have ventured into geothermal development. The Menengai project is a partnership between the government (public) and Private sector (IPP). In this project, GDC is selling steam to private actors.

This strategic thinking is as a result of the vast experience that Kenya has gained since 1957 when geothermal exploration began.

Beyond electricity, Kenya is ahead of the pack in direct utilisation of geothermal resources. For instance in Menengai, GDC has successfully piloted several direct use projects, which are ready for upscaling The conceptual thought is to create a vibrant industrial park rising from geothermal power. *(see our main story).*

All these factors make Kenya and GDC a hotbed of geothermal technology and an incubation centre which will propel Africa's renewable energy to higher levels.

> *The region will experience an economic boom, when more countries venture in to geothermal energy.*

A geochemist at work in Lake Bogoria. GDC has rolled out an elaborate training programme for African Countries.

Step!

Baringo residents line up for water from a GDC truck. *Inset,* **one of the residents quenching her thirst**

GDC enhances community relations in Baringo County

GDC's provision of water in the North Rift region has endeared the company to the host community, boosting relations as GDC prepares to drill close to 3000MW of geothermal energy in the county within the Baringo-Silali project.

The project has seen GDC donate 300 plastic drums across 15 schools and four health facilities to facilitate the distribution of clean and safe drinking water, identifying 20 water points for community water collection.

According to Grace Mwai, the Manager, Community Relations, GDC earmarked water as a critical component required by the host community for sustainability of the domestic and animal use thus embarked on a program geared towards providing this crucial resource for the residents of Baringo.

"The distribution of water is part of our humanitarian commitment to the communities we operate in. Most of the time, the Baringo-Silali area is dry. People have to walk for long distances to water their animals and to fetch water for domestic use. We are trying to reduce this suffering," explains Ms. Mwai.

Through this water distribution programme, GDC has distributed 160, 000 liters of water. The water is mainly targeted to institutions, which include Loruk dispensary, Tuwo dispensary, Meisori health centre as well as Eldume IDP camp among others.

"We shall keep on providing this essential service to the people. We are part of the community and they can always bank on us for such support," Ms. Mwai reaffirms.

The water distributed by trucks has saved families from long treks. It has also allowed children ample time to study instead of going to search for the commodity.

"But the future is even brighter," says an excited Ms. Mwai. "GDC is constructing a water supply system for drilling operations. Once completed, there will be a line dedicated to the community for household use and for water the animals."

GDC's social license granted as Nakuru welcomes power plants

By Grace Mwai and Pascal Manaan

The biggest headache for mega projects, after financing and undergoing all the rigorous state approvals is the subtle, sometimes ignored, yet critical consent from communities otherwise known as social license. It is never done on paper; neither does it have seals nor rubber stamps. You cannot touch it; it is there nonetheless. It is written though in the hearts and minds of communities bordering projects. Ignore it at your own peril.

That is why, recently Quantum Power East Africa (QPEA) which is set to build a 35 MW power plant at the Menengai Geothermal Project, had to spend quality time with communities there.

In tow was the African Development Bank (AfDB) Gibbs consultants, Haskoning DHV-AFDB advisors from the Netherlands. The mission was simple yet crucial – to establish the degree of social license that Geothermal Development Company (GDC) enjoys in the area.

And it was a whirlwind of sorts. The team traversed different villages covering a total of six in a span of two weeks.

Community support is critical to the success of projects. Therefore, constructing and nurturing mutual relationships has been at the core of GDC's community engagement.

During the exercise the AfDB, consultants and advisors had an opportunity to interact freely on a one-one-on-one basis with community members. This engagement provided sound insights into the communities understanding and support of the project.

It was also an excellent opportunity to examine the sustainability of community relations strategies and the emerging issues regarding the project. The meetings were representative bringing on board women, youth, opinion leaders, area administration and persons living with disabilities (PWD'S).

This is how...*Mr. Pascal Manan (Centre) the GDC Senior Communiy Relations Officer explaining a point in one of the meetings with communities. Joanne Wamuyu, GDC General Manager Corporate Services (2nd left) was also present*

It's this transparency that earned GDC the critical social support for the implementation of the project.

The community applauded GDC's operations in the area and pointed out several community projects undertaken by GDC in the recent past. This included renovation of Bahati County hospital theatre, St. John Mission Hospital, provision of water, ambulance services, and donation for building of the dormitory, employment among others.

They also encouraged all Independent Power (IPP's) Producers to emulate GDC by continuously engage the community at all stages of the project development and during the operation stage.

They also welcomed the upcoming development of the power plants and pledged to provide support to ensure that the project is successful. The community also expressed optimism that the development of the power plant would provide additional job opportunities and stimulate growth around Menengai and its environs.

As key stakeholders, community's supportive actions can only be attained with continuous engagement. This means that teams have to spend time to understand different concerns and aspirations. Such engagements have proven incredible at GDC for they produce clarity of expectations. It has been easier to engage in beneficial areas as a result.

Of course, communities will be optimistically cautious about projects in their midst. This is a universal trait. And it is of course with a valid reason. Projects have their good and their bad even their ugly. If the bad and the ugly exceed the good, it is the community that suffer.

That is why at GDC we ensured that the community is fully in the picture about the project. It's this transparency that earned GDC the critical social support for the implementation of the project.

The next phase of Menengai is in power plant construction. It explains why Quantum and other key stakeholders got interested lest they invest in a project whose community is aggrieved. Quantum left Nakuru with a huge smile. There is a huge reservoir of reputation that GDC has nurtured in the community. There is a valid social license to operate.

The team that negotiated GDC's CBA taking a break in Naivasha

Reflections from the hot seat

Negotiating GDC's "deal of the year"

Simon Kiplang'at
General Manager
Human Resources & Administration

Deals are sweet, yet tricky to strike. But, recently, we made one successfully with the new staff union at Geothermal Development Company (GDC). Still, before we could proclaim the now famous "we have a deal," management and the union team engaged in one long roller coaster of negotiations that span for months.

Such a windy journey was to be expected.

By every measure, GDC is a relatively new entity in the public sector having been created eight years ago. Staff did not have a union for articulating their voice and for collective bargaining of the condition of service. And so, when the bell tolled for staff to join one, naturally eyes rolled in the boardroom. Then, there was jittery.

This is for a reason. The world over, Unions have not had a rosy relationship with employers. And indeed, the nature of the workplace, more often than not, has been that of mistrust and suspicion. The traditional tag-of-war between the two parties has been informed by employers demanding optimum service from the employees. Conversely, employees want to offer little at maximum returns.

Paradoxically both parties need each other. The employer needs labour; the employee needs wages. This reality spawned the search for equilibrium through a series of negotiations common in labour relations since the founding of the International Labour Organisation (ILO).

That's why Union representation is part of governing configurations and culture of leading corporates. Cognisant of this, and of the provisions of the Constitution of Kenya 2010, and Employment Act 2007 article 41, GDC supported the creation a staff Union.

Thus, unto us, we got the Kenya Electrical Trades Allied Workers Union now popularly known as Ketawu – GDC Branch.

But it was not until 2017 when the union finally actualised and with it followed a series of negotiations from Recognition Agreements to the Collective Bargaining Agreement (CBA).

Though many organisations shy off from unions, at GDC the wisdom of our Chief Executive Officer was straight forward: That forming a union was inevitable for it's an employee's right and it's in the best interest of the organisation and indeed the public when staff feel they are well represented for this creates stability and optimal utilisation of resources.

Indeed, with sound structures and elaborate representation, dispute resolution mechanisms become easier due to equal terms of engagement.

At first, as is always the case with any negotiations, both the Union and the management played hardball. Sessions involved walkouts. There was a lot of suspicion especially from the Union. They viewed management as antagonists.

With a very committed team of negotiators from both sides, eventually, the two parties were able to tackle issue by issue on merit basis. The issues included dispute resolution mechanisms, and discipline matters. Finally we came to a mutual understanding of the way forward. I learned as part of good and honest negotiation, that transparency and honesty is key, and that hiding cards under the table can be counterproductive.

That's how we made progress.

The beauty is that strong representation minimises violations of rights, while dispute resolution mechanisms are sound and transparent. This way, the work environment is predictable. Such stability is critical for planning and execution of the GDC mandate. It's also crucial for GDC's corporate image.

I was impressed by Union members' strong love for the company. This kind of patriotism is incredible and commendable. Indeed, it clearly demonstrated that unions are not necessarily wired to be disruptive.

On the other side, Management readily offered an enabling environment for negotiation. Importantly, it exceeded the Union's demands.

To succeed going forward with this kind of engagement, we have designed a robust training programme for Union leadership, which include: Labour Relations, and Leadership skills. I'm pretty aware that a Union empowered on diverse issues will facilitate quick conflict resolutions.

Such was a long year dominated by negotiations, going back and forth until we were able to emerge with a deal. A CBA is now ready and awaiting the input of the Salary and Remuneration Commission (SRC) and ultimately registration at the Industrial Court.

Negotiating the first CBA is never easy. That's why I'm delighted of the outcome and that Management and the Union collectively forestalled disruption of duty and activities at the company. It was our deal of the year.

> *"I was impressed by Union members' strong love for the company.*

Personal brand : Stand out in the crowd

Eric Wamanji

Life is about choices- what to buy, whom to associate with, which restaurant to patronise, whom to hire or fire, the list goes on ad infinitum. There is one determinant thread in these choices though, the brand. This is the collective image of memories and experiences impressed on our brains about products, personalities or issues.

Stored in our subconscious, when the images are triggered, we make the choices that we do.

It's the ideal of the brand that drives global commerce. Indeed, great organisations have excelled in brand building. They know too well that a strong, admirable brand begets success.

But I digress. Let's talk about what Tom Peters described as "Brand Called You" or personal brand.

Now, branding is a bit complex and nuanced, more so if it's personal branding which seems to be in vogue.

First things first. We all have our personal brands- this could be by default or by design. Our personal brand is how people perceive us. It's the totality of our idiosyncrasies, our technical skills, fashion, friends, and the language we use, name it. Your peronal brand is what Amazon's Jeff Bezzos considers as "...what people say when you are not in the room."

I can loosely sum up the personal brand into a triad of the sensual, technical and behavioural.

1. *Sensual* –those perceivable by the five senses such as scents, clothing, grooming, language, car you drive, location (where you live, work) etc.
2. *Technical* –skills attained through academic or experiential training.
3. *Behavioural*- interplay of morals, psychological, spiritual predispositions. Manifested in mannerism, and character.

But then, if we all have personal brands, why in the Lord's green earth are we so obsessed with personal branding? Why should we pay experts to spruce up our brand or image? Why should it be an issue in the first place?

Here's the crux – competition. You remember some chap called Charles Darwin with his *Natural Selection of Species?* In the jungle, it's survival of the fittest; in corporate, it's survival of the smartest. Smarts here involves manoeuvrability in the treacherous corporate terrain, finesse and technical knowhow that we posses yet so distinctive from our contemporaries.

That's why as part of your personal branding, you need clarity of thought of your goal. Then, you need to package yourself with all the attributes that will set you apart and help you to achieve the desired goal.

So what will set the "brand you" apart? A collection of issues: your education – get an edge of knowledge and experience above the rest. Demonstrate how useful you're with that uniqueness such that everyone depends on you.

Cultivate finesse in your mannerism. Acquire the right wardrobe. Remember it's style not cost. You may dismiss it as cliché but the right dressing imprints your image in our subconscious. We judge you accordingly, then we decide whether you are fit for purpose or not.

Be careful with social media. Everything you do adds up to how people perceive you. Social media is a dicey area where our brands get soiled or made. Those nudes or obscene language are detrimental to a brand that seeks to rise through the corporate ladder. If I were you – I'll head to my social media and delete all that crap. If you want to share, post about your area of expertise, offer expert opinion and indulge in intellectual discourse.

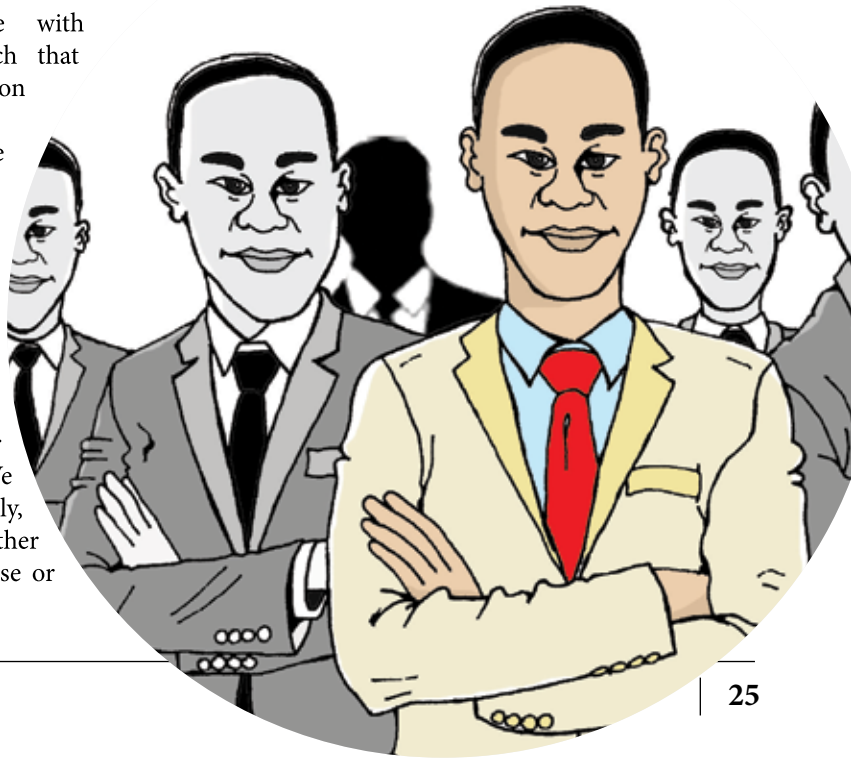
Still at pruning, cut off all mediocre friends. You see, image is transferable; you're judged by the company you keep. To soar high and dazzle, fly with eagles.

Since all successful brands are engineered, you need to take a conscious charge of your image construction, if not other people will model you in their own perspectives. That will jeopardise your fortunes. But remember that this construct takes time, sacrifice and patience.

Then, learn to take stock of your brand. Personal brand reviews will help you to distil how you are perceived and redirect the framing of the ultimate image you want.

And like all brands, you need a buzz to create awareness. Capitalise on speaking opportunities, write in newspapers and journals, be active in meetings, and offer your services pro-bono.

Here's a little secret: to be a brand you must be unique and distinguishable. As the commercials once mused, "image is everything…" "Stand out in the crowd."



Save for a rainy day - it pays

Valentine Odhiambo

"It's not your salary that makes you rich, it's your spending habits'. These are the enriching words of Charles A Jaffe; the American syndicated columnist and author. This quote is a lesson in money management, which many salaried employees ignore to their detriment.

Take James for instance. He's 38 years old, earning a stable income from a salaried job, married with two children. His family lives in a rented house within a gated community. He is proud to provide his family with a middle class lifestyle.

One Sunday morning he reads in the newspaper that the company he works for is relocating. "Business is slow" they say. He quickly opens his emails from his iPhone, hoping to see official communication. But there is none. He tries to dismiss the depressing thoughts clouding his mind, but it's impossible. He then heads to work on Monday morning, and sees his colleagues in groups discussing in hushed tones. Their future is at stake, yet there is still no official communication from the Chief Executive Officer.

The company winds up within three months. James had never imagined that this would happen. It sets him on a path of desperation. He's the provider of the family and showing vulnerability is out of question. He sets out on job hunting but soon realises that jobs are hard to come by.

His savings quickly dwindle. He never in his wildest dreams imagined of a day without stable income. His wife tries her best to foot the family expenses but reality eventually dawns on the couple that their lifestyle was sustained by two incomes. Frustration, bitterness and resentfulness taunt James. Having had enough, one day he walks out of his house never to return.

A recent survey showed that 86% of working Kenyans face poverty in retirement. That means for every seven people, only one is confident of a financial secure retirement. The question is: are you one of the seven? Will you end up like James? Are you saving for your retirement, while still in formal employment?

The trouble with our times is untamed extravagance and the copycat syndrome. We want to spend beyond our means and we want to live the lives of others.

Social media easily confirms this. Hashtags which include #dubaivacay and #weekendinmara are keeping many Facebook users awake late in the night. There is competition to catch up with peers. But, allow me to burst your bubble; at any one given time, someone will be more successful, and even prettier/ handsome than you. So why stress yourself over things that won't change? Struggling to "Keep up with the Joneses" has caused many to become overly attached to the superficial lives, leading them to leading an entire life chasing a mirage of happiness.

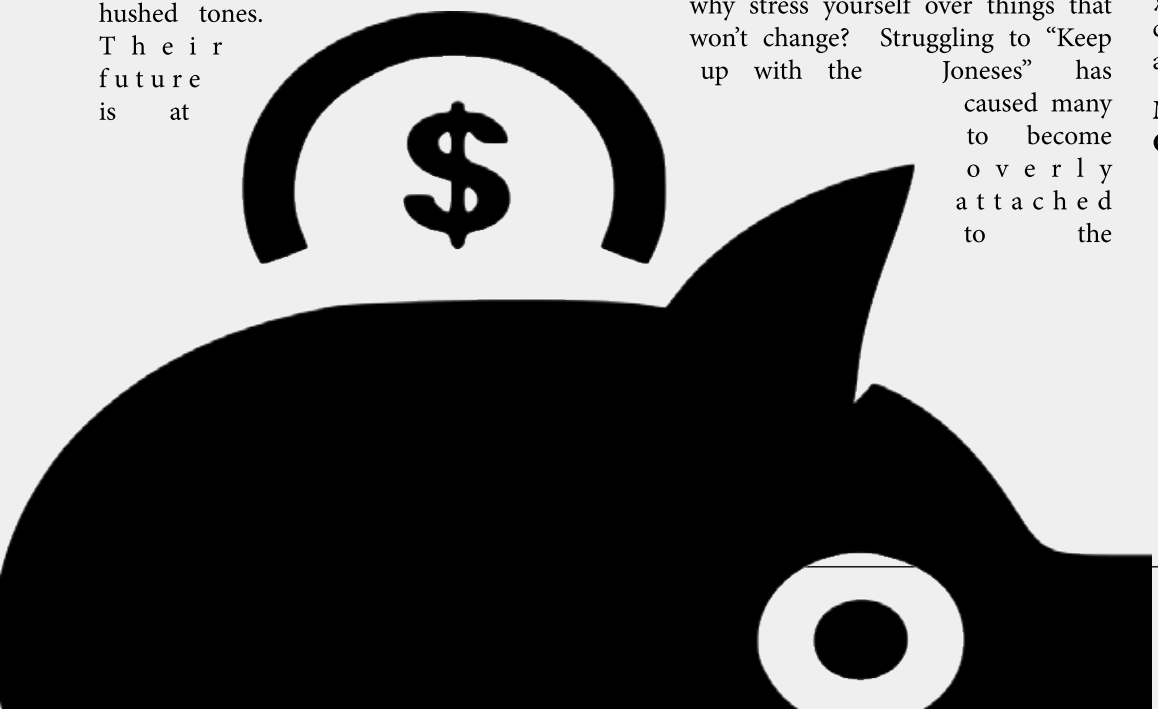
If you think the grass is greener at your neighbours' house, check his/her water bill. Don't compare yourself with others. Live within your means and save for tomorrow. If you save money now, you will enjoy the savings in future. God is wise, there is no way he could have allowed a certain lineage to struggle year after year. There is always a breakthrough. Be the breakthrough for your lineage or at least try.

So what are you doing to secure your financial future? And what can you do to secure it, if you have not started? Start saving money consistently. In whatever you do be consistent. Borrow loans to invest not to fund your lifestyle. Save money for that anticipated holiday. Do no use a credit card to buy that shoe. Save money and buy it for cash. Do not spend money in anticipation - even if you are expecting one million Kenya Shillings in a week's time. Do not go on a spending spree with anticipated money in mind.

Get out of that debt trap before it becomes your death trap. You are in a debt trap if you borrow from A to pay B.

Slow down on expenses. Live a good life but do it within your means. It doesn't matter how much you earn -consistency in saving is what is important. If your current financial status is not where you want to be, let that be your motivation. The key is being consistent in saving money; while at it, be happy. Be financially free.

Ms. Odhiambo is an Audit Officer at GDC



The trouble with our times is untamed extravagance and the copycat syndrome.

Transforming the African Continent through capacity building in geothermal technology

Dr. George Muia

Nothing drives national economies like energy. From the east to the west, all big economies flourish thanks to availability of affordable and abundant energy. It is energy that actualized the industrial revolution and still powers the world's economic juggernaut.

The difference is that from intense human labour to horsepower, to fossil fuel, today, the energy regimes the world over, is changing towards renewables. That is where geothermal energy comes in.

And Geothermal is more critical for Africa, which has largely lagged behind in electricity generation and industrialization. But for Africa to invoke its geothermal power, it requires a rigorous process of capacity building.

That's why it was gratifying when on May 21, 2018, we inaugurated the first ever geothermal training under the auspices of the Africa Geothermal Center of Excellence. The training attracted 22 students drawn from 11 countries, which lie along the East Africa System (EARS). This is a region on the African Rift Valley where geothermal resources abound.

Mr. Jeremiah Kipng'ok, GDC's Geochemist, shows Ms. Ayan Aden a trainee from Djibouti how to take fluid samples

> *The training is part of an ambitious programme that is geared towards building and consolidating a huge reservoir of expertise in geothermal technology.*
> **- Dr. George Muia**

The training is part of an ambitious programme that is geared towards building and consolidating a huge reservoir of expertise in geothermal technology. It is this expertise that will ultimately unlock Africa's huge geothermal which is largely a sleeping giant.

Indeed, the countries on EARS boast of large geothermal deposits estimated at 23, 000 MW. The challenge has been in the lack of expertise. In Africa, only Kenya has technical resources on geothermal energy.

Yet, these countries cannot succeed to harness their geothermal resources without experts.

The Africa Geothermal Centre of Excellence (AGCE) with other partners will continue to offer capacity building at different levels on geothermal technology to ensure that our economies are appropriately powered by geothermal energy.

Importantly, the Government of Kenya through the ministry of Energy has committed to this training endeavor. GDC and KenGen will help to implement the programme. It's noteworthy too that the African Union is also keen in seeing the rise and spread of geothermal on the continent.

At GDC we have laid out robust platforms and resource persons to ensure that the international student get the best in training. Our field at Menengai and Baringo Silali provide spectacular environments for students to learn on a hands-on basis.

GDC owns critical geothermal development infrastructure such as drilling rigs, simulators and laboratories.

GDC is also home to some of the best geothermal experts on the continent. Our expertise cuts across all the disciplines such as Drilling Technology, Geosciences including Geology, Geochemistry, and Geophysics), Reservoir Engineering, Environment Management, Health Safety Environment, and other specialized areas of Geothermal Development.

It should not be lost on us that this is the time to turn around the fortunes of the countries in the EARS.

And Kenya is a great country to understudy on how to establish and thrive in geothermal energy. Kenya is the only country in Africa to commercially utilise geothermal for generating electricity. In fact, today, geothermal accounts for 30 % of all the electricity in the grid.

Kenya is also offering a unique opportunity to other African countries to learn aspects of Direct Uses of geothermal energy. Direct Uses offers umpteen opportunities to stimulate industrial growth and boost food security in the region.

The Kenyan case has proved that you can't go wrong with geothermal energy. Most countries will find this energy to be quite critical especially in stemming the hemorrhage of currency spend on procuring biofuels for power generation.

It will be exciting to see how the AGCE will transform our continent with experts and power. I'm indeed proud that Kenya has become the hub of geothermal technology where Africa is coming to learn.

Dr. Muia is the General Manager, Strategy, Research & Innovation at GDC.

This way... *Mr. Paul Ngugi (right) the Regional Manager Central Rift takes guests around the Steam Gathering System at the Menengai Geothermal Project.*

My Point is... *Mr. David Caroll (rigt) Director, Business and Project Development, Quantum Power E.A explains a point to GDC staff at the Menengai Geothermal Project*

Goes all the way... *Mr. Benard Rotich, of Direct Uses shows the expanse of the Menengai Geothermal Project*

Read my sign.... *GDC's staff Ms. Sahara Hassan communicates using sign language as Ms. Molly Anyango looks on during a specialised training on the Kenyan Sign Language*

This is how it works... *Mr. Arcadius Angalwa, a Reservoir Engineer, explains to visitors how a master valve works in containing steam froma well.*

Look!... *Mr. Stephen Onyango, a Reservoir Engineer shows a visitor how a gauge works at a geothermal well in Menengai.*

Let's draw it...*Mr. Cornel Ofwona, the General Manager, Geothermal Resource Assessment, explains to visitors about Menengai Geothermal Project using sketches*

This is how it's done... *A GDC scientist explains to a group of international students on how to collect geothermal samples for analysis*

The right sample... *Mr. Gilbert Kiptui, a technician places samples for analysis at the GDC labs in Nakuru.*

Story of our project... *Mr. Paul Ngugi (right) the Regional Manager, Central narrates the history of Menengai Geothermal Project to visitng KFS officials*

This is it... *Mr. Gabriel Wetangula, (left) explains a point to visitors from Kenya Forest Service who had visited the Menengai Geothermal Project*

Warm-up...*the GDC FC warming up before a match in Nakuru*

Members of the GDC football team before a match at Afraha Stadium in Nakuru

GDC football team aims for high goal

BY ENOCK NGOME

The GDC FC which had a fairy tale last season winning the Football Kenya Federation (FKF) Central Rift League that earned them promotion to the FKF Nationwide Division 2 League, has set eyes on higher leagues in the country.

The former Elim FC, which changed to GDC FC after receiving sponsorship from the company comprises of GDC staff both on permanent employment and contract and friends of GDC mainly within the Central Rift region.

The FKF Nationwide Division 2 League has 32 teams that are split into two pools each comprising of 16 teams.

With young, talented and energetic players, the team is hopeful it will keep the same fighting spirit like last season to earn promotion.

"We have a strong team that is determined to rise to the higher leagues. Always it's a players dream and hope to play at the top most leagues everywhere in the world of sports and ours is no difference," says Mathew Mutua one of the senior players in the team.

Since GDC came on board last year, the team has had no issues with logistics like paying of participation fee, pitch fees, player meals and transport have now been catered for. The GDC sponsorship came in handy to the team considering they now play in a wide league covering eight counties (Nakuru, Kisumu, Homabay, Kisii, Kericho, Bomet, Migori and Nyandarua).

Top Scorer

Captain Edwin Wenani who last year scored 21 goals for the team to emerge the league's top scorer is hoping that his boots will still remain in perfect shape to shoot in more goals in the new league.

"I am optimistic to score more goals this season in the new league. I did not play the opening games of the season but now I have fully recovered and returned to the team and soon I will be hitting my top form," he says.

Last year the team had a chance to play in the lucrative GOTV Shield Cup where they were eliminated by Vihiga FC. The team also enjoys a massive home ground support from GDC staff in Nakuru who always turn up in large numbers to support them during matches in Nakuru.

Great talent

"GDC has a lot of talent when it comes to sporting disciplines. We have had staff who have even represented the country in different sports and that's so encouraging. Formation of the team has helped many staff members both players and non-players to utilize their time well. We have those who accompany the team to their daily trainings which also makes them physically fit and those who always go and cheer the team giving them a perfect chance to relax as they enjoy the game over the weekends," quips Senior Engineer Nixon Osundwa who is also the Chairman of the team.

With the team spirit high and support from the company they are aiming to score higher.

With young, talented and energetic players, the team is hopeful to keep the same fighting spirit like last season to earn promotion.

AT GDC WE USE HOT GEOTHERMAL STEAM TO HEAT GREENHOUSES FOR FOOD PRODUCTION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