Day GDC wowed Senate

GDC strikes Africa's biggest well

Steam

A Publication of the Geothermal Development Company | Issue No.10 | Feb-Apr 2015

GEOTHERMAL BOOM

Powering Kenya to a Golden Age

GDC GOES BIG IN TRAINING AFRICA

ALSO Step! CULTURE | WORKPLACE | PEOPLE INSIDE

Welcome to Menengai Geothermal Project

Come witness the making of the world's newest geothermal project.

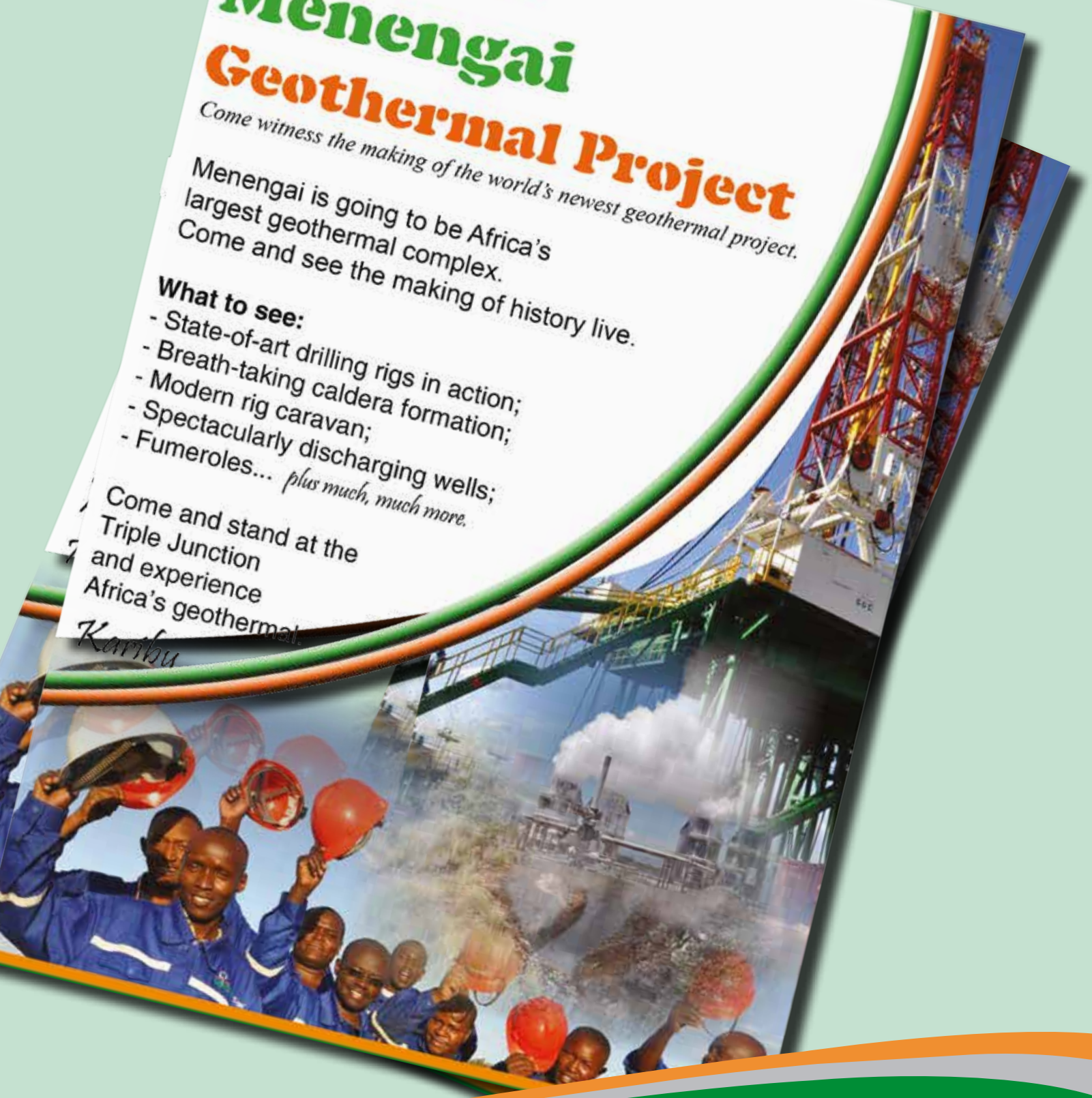
Menengai is going to be Africa's largest geothermal complex.
Come and see the making of history live.

What to see:

- State-of-art drilling rigs in action;
- Breath-taking caldera formation;
- Modern rig caravan;
- Spectacularly discharging wells;
- Fumeroles... *plus much, much more.*

Come and stand at the Triple Junction and experience Africa's geothermal.

Karibu



GDC Geothermal Development Company

Powering the Vision

GDC Geothermal Development Company
Powering the Vision

Editorial Committee

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

Steam is published quarterly by the Geothermal Development Company Limited (GDC). Views expressed in this publication do not necessarily reflect the position of GDC.

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From the Editor

Happy New Year and welcome to our new enriched issue.

Much has happened in the Kenya's geothermal scene, more so at GDC. Here we bring you the incredible story of success from GDC where, just within five years our Menengai project has matured for production of 105 MW. GDC is also making major headway in drilling super big wells. Our drilling crew has registered a 30.6MW well, quite a fete in this business.

Indeed, there's a steam boom in Kenya, thanks to GDC. And now meet the IPPs who are ready to generate power from Menengai. In our **Step** section read the captivating story of Ms Florence Mashipei who took the next step and is on path to great career growth.

Welcome aboard and savoir our finest.

Cheers!

Ruth

Feb - Apr 2015

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SHOW THE WAY

Green energy production is our future and geothermal must lead the way as we approach the year 2030 which will be a critical milestone in Kenya's energy independence. Kenya, as the top African country in geothermal production, needs to fast-track the achievement of this kind of energy which is sustainable, green and indigenous. GDC, as a vehicle towards achievement of this, has to be in the fore-front towards this great dream.

Hussein Mwitani,
Mombasa

Frank Orinde¶ @frankorinde
Jan 7

To realize 24hrs economy, u need stable,reliable & cheap energy for sustainability, Geothermal energy is the answer #GDCSteamwonder

Odhiambo KGM @odhisghai24
January 2

Our nights will be as bright as the day in the sun. Affordable and available electricity is all we need #GDCsteamwonder.

Frank Orinde¶ @frankorinde
Jan 2

GDC's project-Menengai will lower cost of living,there will b reduction in use of diesel 2generate power,#GDCSteamWonder=Affordable power

twitter
@ GDC5000

GDC5000

THEY SAID...

Success will come, one step at a time.

Florence Mashipei on how she took the next career step

We're confident about the Menengai Project that is why we're putting our money into it..."

Caroline Waiyaki, Director, Sosian Energy during the site hand over ceremony

Write to us

The Editor welcomes letters on topical issues. Write to the Editor, Steam, Geothermal Development Company, P.O. Box 100746- 00100, Nairobi, Kenya. Email: steam@gdc.co.ke. The Editor reserves the right to edit letters for space and clarity.

The Menengai dream is now a reality

We start the year on an electrifying note. The Menengai Geothermal Project is ripe to generate 105 MW. This is incredible considering that we started operations in Menengai just five years ago. Yet, as of January 2015, GDC has drilled 25 wells with steam worth 130 MW. Three Independent Power Producers (IPPs) are now moving to the project to build the power plants, and we hope that by the end of the year, Menengai will be streaming electricity to the grid. It will go down the record as the fastest developed geothermal project.

The terrific growth of Menengai is closely watched in the geothermal world. This is because our model to drill and then sell steam to investors proves to be practical and the crack code to the usually long gestation periods associated with geothermal development.

When the electricity from Menengai is finally dispatched, it will save our country about Ksh. 13 billion every year. That huge money would otherwise be used to buy diesel to generate equivalent electricity. We should also note that the power from Menengai will be cheaper, at Ksh 7 KhW; ordinarily diesel-generated electricity costs about ksh 22KhW. That is why electricity from geothermal will in turn help to lower the cost of your bills. Ultimately, we know that once the geothermal power from the different fields come on line, our bills will be reduced by 30%. A diesel-free grid also means that Kenya can save about Ksh. 45 billion annually hemorrhaged by heavy fuel.

> When the electricity from Menengai is finally dispatched, it will save our country about Ksh. 13 billion every year.

This means that investors will greatly save on energy. Commodity price will drop and thereby spur consumption. Besides, the world over, affordable reliable power attracts manufacturing which creates employment.

We should also recall that the Menengai wells are drilled at half the price private drillers would charge. It is clear that our strategy of owning rigs, apart from creating the much needed employment for our youth, it also helps to lower the cost of power.

And we are now opening up the Bogoria-Silali Block. The Germany's kfw approved a loan of Ksh. 9.6 billion to drill 20 wells. The funds will now open up the prospect where we target to generate 200 MW by end of 2016.

We are committed to improve access to electricity and to reduce reliance on bio-fuel in the city and in the village. The future of geothermal is well cut-its bright as it offers solution after solution.

Dr Silas Simiyu MBS
Managing Director & CEO

BIG stride: GDC at a glance 5 years on

IMPACT OF 105MW PROJECT

105 *MW to be generated in Menengai*

- Increased Megawatts to the National grid
- Tariff (US$0.07)
- Enriched Grid Power Mix
- Private Capital Injection (approx. US$210Million)

13 *Billions in Ksh. that the 105 MW from Menengai will save government annually*

PROJECT STATUS

7 Rigs deployed to the project as follows:
. GoK funded – 2 rigs
. AFD funded – 2 rigs,
. AfDB funded – 3 rigs

Drilling Progress

25 wells drilled
120 MW available

Steam Gathering Commenced

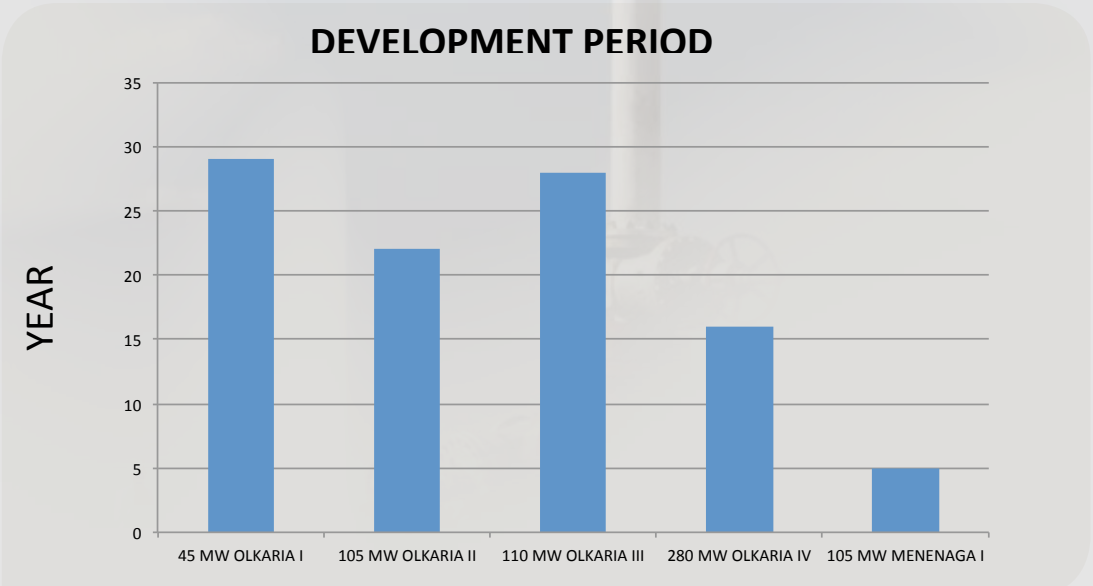
Available Steam

Olkaria 59 wells 409MW
Menengai 25 wells 120MW

GDC INPUT IN 5000+MW 2016 DEC

PROJECT AREA	Plant Size
Menengai	105 MW
	60 MW
	100 MW
	100 MW
	100 MW
Suswa	50 MW
	100 MW
Baringo - Silali	100 MW
	100 MW

TIME TAKEN TO DEVELOP DIFFERENT GEOTHERMAL FIELDS IN KENYA



Menengai is the fastest developed field in the world

Pictured:
The Korosi geothermal prospect in the Baringo-Silali block

Germany funds to unlock Bogoria-Silali

The German Development Bank (KfW) has granted GDC a Ksh 9.6 billion loan for geothermal development at the expansive Baringo-Silali Block. GDC will use the funds to drill 20 geothermal wells in the first phase of 200MW.

"The loan will cover initial high cost associated with development geothermal power field paving the way for the private sector to come in and generate power from the steam," KfW vice president Christian Kramer noted.

Other components of the loan include the development of water system infrastructure and consultancies.

Already GDC has started to build roads and water reticulation system in the region. A tender for drilling operations has been floated and at press time it was under review so was the tender for water supply.

GDC will leverage on these financing to attract other financiers to the block. Consequently, GDC will develop this prospect in phases targeting 800 MW by 2022 in what will emerge as the world's largest geothermal complex.

And the government is upbeat about the financing.

"The national government is committed to diversification of energy sources which has previously been dominated by hydro-power. Unreliable rainfall and erratic weather patterns have affected hydro-power sources," noted Mr. Henry Rotich, Kenya's Cabinet Secretary, of The National Treasury.

A further injection of cheap, reliable energy to the national grid in two years time will be a major boost to the economy as it will lower electricity tariffs and encourage manufacturing and investment.

Equally, Baringo-Silali will open massive investment opportunities for Independent Power Producers (IPP) who will put up power plants.

The community will greatly benefit from an expanded economic web that will offer employment opportunities in the short term, and investment in direct utilisation of the energy in an array of areas like leisure and recreation, honey processing, meat canning and tanning.

> "GDC will develop this prospect in phases targeting 800 MW by 2022 in what will emerge as the world's largest geothermal complex

GDC commissions new rigs

The Geothermal Development Company (GDC) is commissioning three new drilling rigs at the Menengai Project. The rigs that were recently acquired are undergoing installation and testing as a standard practice.

The rigs called Ndovu One, Ndovu Two and Ndovu Three, have now brought to seven the number GDC owns. According to the company engineers, the rigs will speed up the drilling of geothermal steam that is used to generated electricity.

"So far the progress of the rigs is impressive," said Johnstone Maleche, the Manager Drilling Operations. "This installation and commissioning is key and is normally done by the supplier. He must prove that the rigs are working."

GDC is accelerating the development of geothermal energy in support of the Jubilee government effort towards affordable, reliable and green energy. Already the firm has drilled steam wells with an output of 120MW. This steam is more than enough needed for the first 105MW expected to be generated by the end of the year.

The rigs were financed by the African Development Bank (AfDB). The arrival of the rigs is a welcome development in the geothermal sector. It is also a major boost to the country's efforts to develop geothermal energy highly relied on as the panacea to the perennial power outages.

Cost cutting strategy

The rigs are also part of GDC's strategy to cut the cost of drilling and subsequently the cost of electricity. Normally, when GDC deploys its own rigs, the cost of drilling is cut by a half. Besides, the rigs serve as a great training ground for upcoming drilling engineers and technicians. Hired rigs come in with expatriates and have very little technological transfer to the location population. GDC efforts in the past five years has developed a massive pool of drilling experts who will also be useful during commercial oil and gas drilling.

GDC is constructing steam pipeline in Menengai

Construction work for the Steam Gathering System at the Menengai Geothermal Project in Nakuru is rolling off earnestly in preparation for the first 105 MW power plants.

Contractor, H. Young & Co. (EA) Ltd is on site to build the network of pipes that will collect geothermal steam from different wells and transmit them to the power plants. Already, a control room is almost complete. GDC has also handed over the power plant sites to the three IPPs who will put up power plants.

The Steam Gathering System is a critical mega-infrastructure component in any geothermal project. It is the link between the production well and the turbine as well as for disposal of the separated brine and condensate and therefore calls for a high level of sophistication in design and construction.

The project is under the supervision of Mr Cornel Ofwona, the Manager Resource Management. "Everything is on course. We're expecting to complete the project by June 2015," assures Mr Ofwona.

The pipeline is financed by the Government of Kenya and will be 25 KM long. The pipeline will feed three power plants through a common header. GDC engineers carried out the initial preliminary design, preparation and evaluation of bid documents. The Contractor did the detailed design, procurement and construction with approvals from GDC.

"The pipeline is designed to 30% over capacity to allow for flexibility and future expansion," explains Mr Ofwona.

Cornel Ofwona

GDC chairman, Abbas, welcomes investors to Menengai

Welcome: Mr. Faissal Abbas, the GDC Board chairman during the hand over of powerplant sites to IPPs in Menengai

The presence of private investors in Menengai is a sure indicator of the viability of the project, Mr. Faisal Abbas the GDC Chairman of the Board of Directors noted as he led the company to hand over power plant sites to the Independent Power Producers (IPPs).

"The presence of the IPPs at the Menengai Project affirms that our model of geothermal development is practical and viable," Mr Abbas noted.

A jovial Mr. Abbas in his address to the IPPs and the GDC Board of Directors and Management noted that geothermal has opened new investment frontiers.

"This model of engaging the IPPs especially in the purchase of steam is a first in the world. I am proud that GDC has already availed steam worth 120 MW, which is enough for the first phase of the Menengai Project," he said.

The IPPs who will construct the first 105 MW power plants are Sosian Energy, Quantum, and OrPower Twenty Two. They will each put up power plants of 35 MW each.

Menengai Phase One is part of the 5000+MW Project spearheaded by the Ministry of Energy and Petroleum. In this framework, GDC will develop 810 MW by the end of 2016.

"This is a small step. It's a bold step nonetheless. This is where it all begins as we turn our rift valley into a geothermal power house," Mr Abbas said.

GDC through the Government of Kenya and development partners has heavily invested in the geothermal infrastructure and assets. To date, GDC owns seven deep drilling rigs. Three are brand new and are undergoing commissioning. The rigs will essentially accelerate the drilling operations.

"Our raison d'etre is to guarantee Kenya's energy independence and to reduce the cost of electricity. Our goal is to displace all the thermals and replace them with clean, affordable and reliable geothermal," the chairman explained.

Cost reduction

Indeed, geothermal will reduce electricity cost from highs of about Ksh 22 per kilowatt-hour to Ksh. 7 per kilowatt-hour.

"I know as a country we spend about Ksh. 45 billion each year on diesel. With the coming of geothermal, this money will be saved for other pressing sectors of the economy. That is why I want to thank our financiers for their commitment and support toward this noble project," he said.

Enough cheap electricity will attract diverse investors and spur economic growth in our cities and villages. It will create employment and reduce crime.

"We have confidence in our investors whose corporate profiles are nothing but admirable. We know they will also bring the corporate ethic and culture to the geothermal sector," he said.

The chairman appealed to Kenyans to venture into the geothermal enterprise. He said there is proven resource and expertise that such outfits like Saccos, investment groups and equity funds can gain a great deal by investing in geothermal energy.

> We spend about Ksh. 45 billion each year on diesel to generate electricity. With geothermal, this money will be saved for other pressing sectors of the economy.

GDC strikes Africa's biggest well in Menengai

On a brisk bright day, Menengai is abuzz. Trucks hauling construction material creak on the meandering earth roads, maintenance workers are sweating as they connect water to drilling rigs, while technicians and drilling engineers engage gigantic rigs during the drilling process. But then, there is a roaring well spouting off-white steam amid 12 silencers, a spectacular icon at the caldera.

Here is well 1A, the source of big pride for GDC – easily the largest geothermal well in Africa. It produces an impressive 30.6 MW. So powerful is the well that engineers are using 12 silencers to control it.

When engineers struck this well, Menengai, and indeed the GDC fraternity was thrown into a trance. Hitting the well is a major boost in the effort to deliver on affordable energy.

"Normal wells yield 5MW-10MW, but this one is producing six-fold at a cost of one well," enthuses Cornel Ofwona, Manager, Geothermal Resource Management.

Such big wells save money and time. "With such big wells, the cost of electricity generation will be much lower and this will be reflected on the tariffs," he explains.

"We employed directional drilling method as opposed to the normal vertical. We are happy that it is our very own scientists who sited the wells and drilled it. This way, our energy plan is firmly on course. In fact, we have excess steam for the first 105 MW," notes Dr Simiyu.

30.6

No. of Megawatts from Well 1A in Menengai

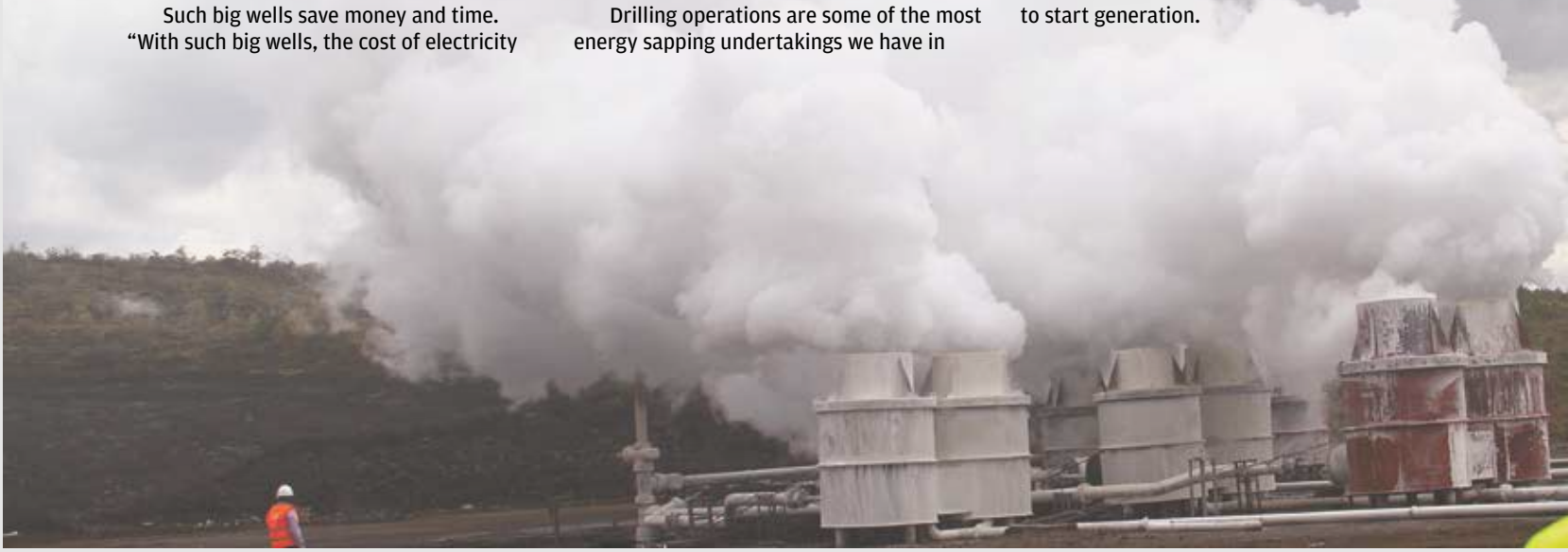
GDC is developing the first 105 MW in Menengai by the end of 2015. Already, at press time, 120MW worth of steam had been achieved from 25 wells. The steam will be sold to Independent Power Producers (IPP).

Drilling operations are some of the most energy sapping undertakings we have in the land today. Drilling for geothermal is an expensive, arduous, highly specialised and time guzzling enterprise. Ordinarily it takes 80 days to drill a well that would yield 5MW. Yet, here is one, drilled within 80 days with a six-fold output.

Engineers and scientists at Menengai aver that the future of drilling will be directional with expected big results. With such breakthroughs we are likely to see a more accelerated geothermal environment.

As it stands now, the country bleeds heavily every year on fuel imports at a cost of about Ksh. 45 billion. The diesel imported is for supporting the thermal generation. Yet, with such big wells being reported in the geothermal world, the light is in the horizon of a season where we shall retire diesel and rely on our indigenous energy resource.

Menengai, which was initiated barely five years ago, is ready to generate the first 105 MW by the end of this year – an achievement never witnessed anywhere. With 25 wells and 120MW of steam, the first three Independent Power Producers (IPPs) are angling to start generation.



> "Ordinary wells yield 5MW-10MW, but this one is producing six-fold at a cost of one well

Addis on the cusp of geothermal independence

Ethiopia is closely angling itself to to join Kenya in the league of Africa's leading geothermal countries.

Recently, the Horn of Africa nation received a big shot in the arm following a move by the World Bank Group approval of a whooping credit of US$178.5 million from the International Development Association (IDA). Addis further received a US$24.5 million grant from the Scaling-Up Renewable Energy Programme (SREP) Trust Fund to help the nation develop its geothermal resources.

This happened hot on the heels of another ambitious partnership where the country signed a preliminary agreement with a US-Icelandic firm, Reykjavik Geothermal, for a US$4 billion private sector investment intended to tap its vast geothermal power resources.

Some of the world's biggest and emerging economies are closely developing appetite for Ethiopia's geothermal, a move which will see the nation emerge as a major exporter of energy for East Africa.

Ethiopia, last year, commenced on the development of a 1000 MW geothermal power plant, which is touted to be Africa's largest and will be based in the volcanically active Rift Valley.

The deal was signed by Reykjavik Geothermal CEO Gudmundur Thoroddsson and Mihret Debebe, his counterpart at the state-run Ethiopian Electric Power Corporation (EEPCO), in Addis Ababa.

Ethiopia's Prime Minister Hailemariam Desalegn says the country will need to harness as much as 80, 000 MW of hydro, geothermal, wind and solar power over the next 30 years not just for itself, but for the neighboring countries as well. He added that what Africa needs now is not just aid but trade and investment.

Ethiopia currently suffers frequent blackouts because of a lack of power. But it is due to boost its generating capacity from 2, 000 MW to 10, 000 MW within the next three years, much of it coming from the 6, 000 MW Grand Renaissance Dam under construction on the Nile.

Pictured: A discharging well at Ethiopia's Aluto Langano Geothermal Project

Djibouti banks on geothermal to power economy by 2020

Djibouti hopes to become the first African country to use 100 per cent green energy by the year 2020, thanks to an ambitious geothermal generation.

Djibouti hopes to achieve energy independence using geothermal power that will enable its citizens to enjoy abundant, cheap and accessible energy across the entire national territory.

"The government, in conformity to the vision of President Ismail Omar Guelleh, will make Djibouti the first African country to use 100 percent green energy by the year 2020," noted the country's Energy minister Ali Yacoub Mahamoud recently.

Just two months ago, the Djibouti government created the Djiboutian Office for Development of Geothermal Energy (ODDEG) charged with the responsibility identifying geothermal resources in the country and execute feasibility studies as well as exploration activities.

Recently the World Bank Group and Djibouti signed financing agreements that will see the two parties launch a project to tap into Djibouti's volcanic riches as a source of geothermal power. International Development Association (IDA), the Bank's arm for the world's poorest countries, pledged to provide a US$6 million highly concessional credit to fund Djibouti's Geothermal Power Generation Project.

"To achieve this, we have put in place a clear process and defined the priorities. Today, the priority for our program to develop green energy is geothermal," the minister added.

Djibouti's geothermal potential which is estimated to be 1,000 MW, will be accelerated through a public private partnership.

Authorities say the ambitious drive will result into a 10 percent reduction in energy costs and will enable Djibouti Electricity Company to be saving 57 million U.S. dollars per year.

> The priority for our program to develop green energy is geothermal

Quality is king

10 questions for the Manager, Quality Assurance & Safety, **George Kinyanjui**

1. What does the Quality Assurance and Safety department deal with?
We are charged with ensuring compliance with industry Standards and other quality standards required for geothermal development and research in order to achieve global competiveness.

2. How is Quality Assurance applied in the development of geothermal resources?
Quality Assurance and Safety upholds standards through technical audits and inspections of systems, processes and equipment among other to ensure that they meet requirements. Through Quality Management System, basic procedures to be followed while carrying out each task to ensure optimum results are put in place.

3. Your department successfully led the Company in the attainment of the ISO 9001:2008 certification, what does that mean for GDC?
The ISO certification has seen GDC adopt the quality management in all its processes by realigning and standardizing its work procedures to best industry practices. The focus on customer has seen most of our customers satisfied due to enhanced customer relations and good feedback mechanisms.

4. Where do you place GDC in terms of upholding quality?
Attaining QMS certification demonstrates commitment to embrace and uphold quality in all areas within the organization.
GDC is among the best companies in the country on quality issues.

5. What other projects is the Quality Assurance and Safety department involved in?
Apart from the implementation and management of ISO 9001 quality management systems, the department also undertakes the following activities:

- Review and acceptance of specifications for operational equipment
- Undertake inspections of company equipment to ensure that they meet specified requirements. The department monitors the status of all the equipment on a monthly basis.
- Achieving and maintaining international/national quality certifications.
- Monitoring of departmental service charters
- Technical audits of all company operations.
- Ensuring statutory requirements in OSHA (Occupational Health and Safety) are adhered to through safety audits and trainings.

6. What does a typical day of a QAS officer entail?
For us it begins with jogging by most members. This is then followed by briefing meetings to set the scope for the day. It involves going to the field of operation, cross checking equipment against standards and consultation.

7. How unique is QAS in a geothermal company?
Geothermal development is highly specialised with few peers around. It's also a delicate and expensive exercise that extra vigilance in quality control should never be compromised otherwise you will run to losses and close shop.

8. Where do you see GDC in the next 5 years in terms of quality?
It will be the embodiment of great quality control entrenched in the system and thinking of everyone.

9. What kind of team do you have?
The QAS department consists of a dynamic team that include engineers, geo- scientist, safety experts, actuarial scientist among other expertise. The team is young and highly motivated in their work.

10. How do you ensure conformity to standards?
Through audits and review of procedures to meet specific standard requirements. We have also scheduled frequent internal and external system audits for ISO and safety.

KENYA'S ROCKSTAR

By Godffrey Olali

The blazing twilight wind whirled hastily past the sunken sun which descended slowly behind the towering hills of Muhuru Bay. The powerful waves of Lake Victoria slowly subside rhythmically as a young school boy disembarks wearily from an old rugged miniature canoe with his catch for the day.

The young boy, would later sell his little tilapia so he could purchase a popular book he desperately required for his forthcoming Kenya Preliminary Examination (KPE) which was just beckoning.

Road to lab

Well, he does't like a rockstar but he is one. This is the story of Sospeter Nyapala Msenya, a seasoned Lab Lapidarist who today works as a Senior Laboratory Superintendent at Geothermal Development Company's laboratories in Nakuru.

"I was desperately in need of this bound volume which was popularly known those days as "Success." Since my parents were not able to finance my studies, I descended to the lake early in the morning daily to catch fish, sell and later prepare for my classes. I worked so hard till I bought that book," Nyapala recollects fondly, revealing how later he would emerge as the overall top pupil in his school, during the 1965 KPE national examinations.

The soft-spoken father of four has been working in the geology labs for over thirty years now. Nearly half of his working life has been spent on rock examination.

Before coming to GDC on contractual basis, he had a stint at the then East African Power and Lighting Company (EAPLC) and Kenya Electricity Generating Company (KenGen).

At 63 years today, Nyapala has all along been associated with geothermal industry despite venturing into it by default.

He witnessed the discharge of the first geothermal well in Africa at Olkaria in 1972 and 39 years later, the veteran would again in May 2011, witness a similar spectacular phenomenon when GDC discharged its first well.

"I'm proud of my contributions in this great industry. I have successfully worked in geophysics, geochemistry, reservoir technology and geology. These are the critical pillars and the backbone upon which any geothermal sector rests," says Nyapala during an interview with Steam in his office. In 1971, Nyapala while working under EAPLC's geothermal project, took part in field exploration around Lake Hannington (today Lake Bogoria) under a project which was supported by the United Nations Development Programme (UNDP).

The wild excursion also saw him transverse other emerging geothermal prospects at that time in Olkaria, Eburru and Mount Longonot. He also participated in the first field exploration in Menengai in 2004 while he was working at KenGen.

But like any other freshly employed graduate, he did not understand why they were combing the rugged bushes in search of geothermal steam. The experience was challenging and extremely strenuous. Even though his passion was in engineering, Nyapala found himself wading in the geothermal waters by default.

Menengai was one of the most challenging places to work. We were combing the bushes from one end to another."

Pictured: Nyapala at work

Today, he quips, no one can believe the kind of development that has taken place in this field.

Nyapala harbours a lot of respect for the emerging big geothermal industry in Kenya. He is at least happy that the government has given geothermal sector a priority as Kenya moves towards achieving green energy independence.

"Geothermal will heavily contribute to green energy requirement for this nation. For a long time, Kenyan government was not keen on developing this resource which is in plenty. Take case of Menengai, the nearby community is already benefiting from casual employment, improved infrastructure, water and general economic transformation," adds the Scottish and New Zealand-trained laboratory veteran.

Nyapala was trained in Scotland by Logitech Company which manufactures Lapidary machines. These machines are used to make thin sections which help geologists to identify altered minerals in the rocks from the wells.

"I use the XRD or X-Ray machine to analyze the rocks and give to geologists who later interpret them. This enables a

geologist to determine the formation of the rock thereby drawing a conclusion whether the well is sustainable or not," says the father of four who cherishes family values.

Secondment

In 1983, Nyapala was seconded by then EAPLC for a two-week short course in Scotland. Prior to that in the early 1980, he also attended a course in geology, mineral identification and downhole measurement in New Zealand for seven months. By that time, he was working as a scientific assistant at EAPLC.

Between 1974 and 1977, Nyapala had a brief stint as an Accounts Clerk at the then East African Community (EAC) in Arusha, Tanzania before its collapse in 1977.

Born on the 10th of July 1950, at Rabwao Village, in Muhuru East Sub-Location to Mzee Erasto Nyapala (now deceased) and Mama Kernel Nyambuge, young Nyapala went to Rabwao Primary School between 1957 and 1960 then proceeded to Bande Intermediate School between 1961 and 1963.

Silver lining

Later in 1964 and 1965, he went back to Rabwao Intermediate School where he sat for his KPE examinations before joining Pe-Hill Akoko Boys Secondary School in Migori County until 1970.

However, the financial woes which befell him during his primary school days seemed to follow him even at secondary level. At form three, Nyapala would be forced to drop out of school for one year later in 1969 for lack of schools fees, condemning him into the strenuous fish mongering business, again. He did not give up hope.

"I was only 19 years at that time. I peddled fish using a bicycle from Kinesi, a small fishing town in Tanzania and later sell them for school fees in Kenya. My school fees was only Ksh600 per year. Fish business was much profitable in Tanzania compared to Kenya and I actually made some little cash which I used to finance my studies," adds the first born in a family of eight – five boys and three girls.

However, luck would later call on the young lad seeing him go back and sit for his KCE examinations in 1970.

Nyapala, a strict family man per excellence has four children – one boy and three girls; namely Richard, Glory, Happiness, Purity and his lovely wife Phoebe who attends to domestic chores at their rural home.

Having come from a locality where only one lady has a doctorate degree, Nyapala cherishes education and that is why he promises to spend up to his last penny to make sure his children get quality education which he did not have an opportunity to enjoy during his hey days.

A teetotaler and an ardent listener to gospel music, his typical day starts at 5:00 am when he wakes up and does some spiritual devotion consult his bible, and then take his breakfast.

His favourite verse in the bible is the book of Psalms 31: 1-4 which says; "In thee, O LORD, do I seek refuge; let me never be put to shame; in thy righteousness deliver me!"

D.O.B

10th of July 1950

Nyapala Born at Rabwao Village, in Muhuru East Sub-Location

Favourite Bible Verse

Psalms 31: 1-4

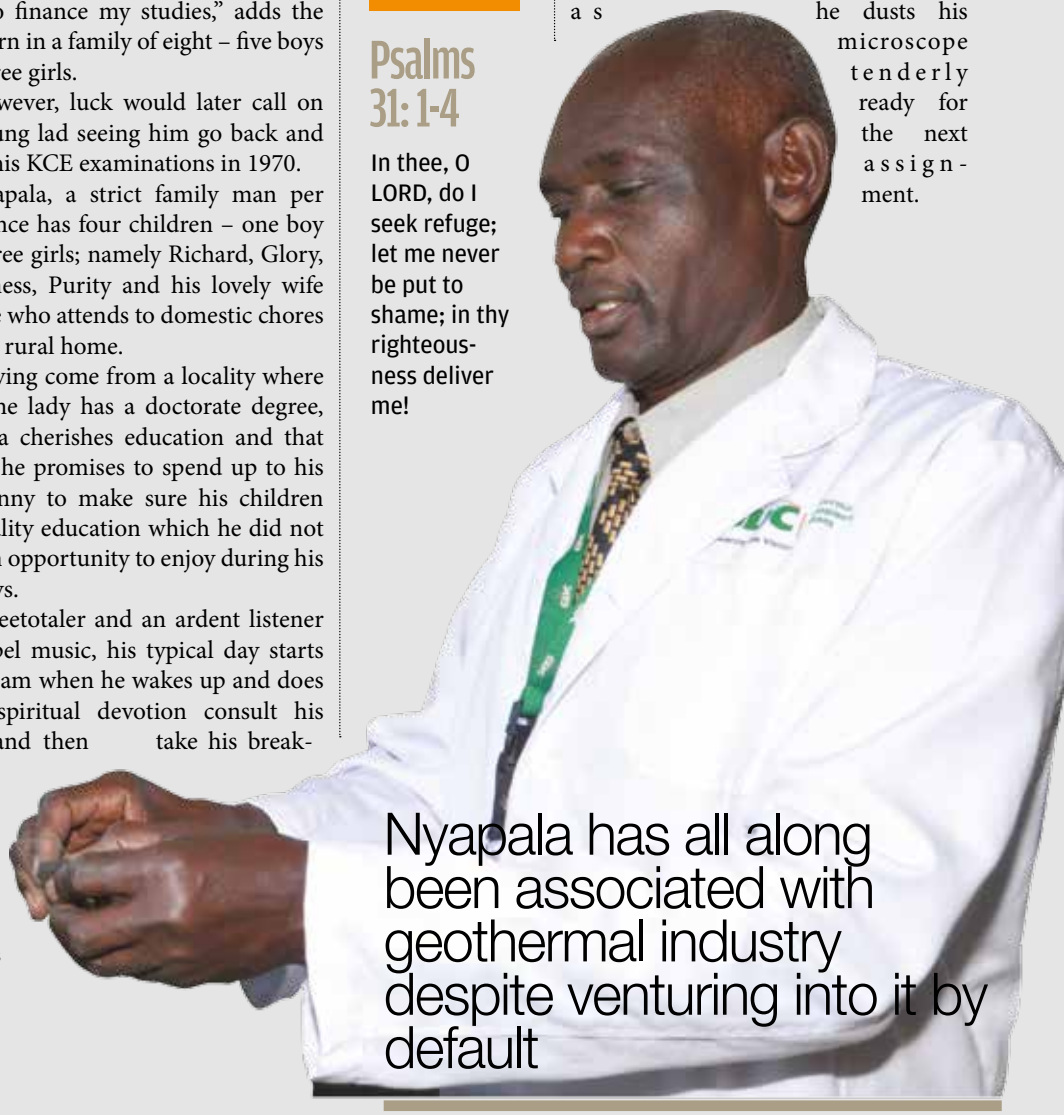
In thee, O LORD, do I seek refuge; let me never be put to shame; in thy righteousness deliver me!

Belief

"I don't subscribe to any denomination but I'm a strong believer in Christian faith and all its values," he stresses.

As we approach the closure of our two-hour interview, the geothermal veteran has some lessons for the communities living near natural resources like geothermal, coal and oil.

"The neighbouring communities need to understand the complications involved in exploration work. Even if it is a matter of dishing out jobs, believe you me they can only secure jobs and contracts which they are capable of discharging. The respective government and the company need to work on workable strategy," he advices as he dusts his microscope tenderly ready for the next assignment.



Nyapala has all along been associated with geothermal industry despite venturing into it by default

THE GIRL TO WATCH

By Evans Mutai

> I love Paris. It comes across as a sophisticated place. I'd like to go there.

It is a dull evening in Nakuru -drizzly and chilly. Vehicles and tuk-tuks buzz around town -just but a polite reminder that we are in one of East Africa's fastest growing city.

But wait a minute, all these is not a deterrence. We must have our day with Janet Suwai, a Senior Scientist at GDC working under the Geothermal Resource Management department, and arguably a girl to watch in the world of geothermal energy.

Her office at Generations House is neat - well organised desk, a laptop sitting in front of her and some piece of equipment, possibly an apparatus for her daily chores, by the side.

"You journalists scare us a lot whenever you ask for interviews," she chuckles as she ushers us to a seat. "I hope you are not going to send my story to to the gutter press" she jokes with a little smile, as she finds her seat.

Her humble demeanor may be deceiving. Janet is a well read geologist with a Bachelors of Science degree in Geology. She is also a proud holder of Masters of Science degree in Hydro-Geology. Hey, it does not end there. A certificate in Advanced Training and Research in Reservoir Engineering and you get a lady who has few peers around. And she does brag about.

At GDC, she is an expert in well measurement, testing, interpreting well data and a key player in integrating well measurements data with other Geoscientific teams. She aspires to further training in reservoir modeling which is a crucial resource management and decision-making tool. This, she says, is key in determining the nature, suitability and even the longevity of our of fields; which eventually aids in determining our status and defining course in pursuit for the 5,000 MW.

The other side of Janet

The cheery but strict Janet loves Tanzanian Queen Rose Muhando's gospel pieces; which in her own words, she describes as inspiring, teaching and touching on the realities of the society we live in.

"I come from a humble background, a third born in a family of nine and from an area where men are valued more than ladies," she says. "During our time, most parents never regarded education and especially for the girl child," she adds, staring sternly at the window, lost in deep thoughts possibly picturing the hurdles that she had to go over to access her education.

The mother of two bemoans how culture and tradition saw girls in her

Janet at a glance...

- She was active in athletics in school
- She bakes, and has even turned the venture into a source of income.
- She is petrified by snakes though she grew up in a snake-prone area
- Her greatest influence is her parents who ensured she went to school.
- When asked how her best friend would describe her, she said 'may be discreet, level-headed, patient'
- She'd like to tour Paris

Pictured: Janet Suwai replaces a well head pressure recorder at well 20 in Menengai

village school drop out of Class Eight or Form Four in favour of marriage, a thought that really gets her annoyed , more so that parents would permit.

"I'm extremely grateful to my parents for letting me take this route. Their support through my high school days and even later at the university is a debt I don't think I would ever be able to repay," she says, with a sad look clouding the jovial and radiant face I was beginning to get used to.

Janet's typical day starts at 5:30 Am. This is her wake up time. After making breakfast, preparing her girl for school and doing other household chores, she ensures that she is at the office by 7:45. Here, she goes through the previous day's work, finalizing on any pending issues then drawing her schedule for the day ahead.

The Mogorwo Primary School, Kapropita Girls School and University of Nairobi alumnus is one proud lady whenever she visits Menengai and passes through the site of MW 01. This, she says, is because of the role she played as part of the team of scientists that explored, analyzed and made recommendation for drilling of the first successful productive geothermal well in Menengai, a breakthrough that birth the now famous Menengai Geothermal Field.

"I'm so proud of all of our team; it was that great moment that I can say I will live to remember for so long," she quips.

Her enthusiasm lightens up her face once again, as she reveals to me of her invitation to Kapropita Girls, her former school, to share some of her knowledge and words of wisdoms with the students as a way of motivating them in their future careers.

"I want to go back there and tell them that they can be somebody in this country and even the world, if they set out to achieve their dreams. With determinations, hard work and discipline, they will get there," she stresses, leaning back on her seat comfortably, a posture that sought to say that this was the entire secret one needed for success.

> "I'm extremely grateful to my parents for letting me take this route.
> -Janet

The girl to watch

A lover of *kienyeji* (tradional meals), mostly goat meat, managu and traditional ugali, the research specialist picks for me one of her professional highs: her first research paper making it to the floor of GRC conference in San Diego, California.

Though unable attend the conference, thanks to her motherly duty call, Janet says that it was satisfying that her co-author made an equally super job on the floor.

"The feeling is absolutely incomparable. Learning that our maiden paper made it to the international floor just passes as my career high," she says, with a broad smile.

Kind words are short and easy to speak, they say, but their echoes are truly endless.

"In life, try to do the best you can and do it to the best of your ability. You may not change what you are not able to do, but you can perfect what you can do. Capitalize on what you can do best."

Indeed, there is no doubt that Janet is emerging as a force to reckon with in the world of geothermal. Her right, even enviable education - and she doesn't brag about it - her demenour, her youthful asset and desire to learn makes her indeed, for others the next big thing, still, she is the girl to watch.

Kenya's soft power in sizzling energy

ERIC WAMANJI

The formation of the rift valley may have handed Kenya a wild card. You can imagine the era when volcanoes erupted with pleasure and in abandon from Longonot to Menengai, from Paka to Silali...the chain is endless especially along the fault-lines of the rift.

Yet, today, that phenomena that must have looked like an extract from hell, is giving Kenya not only scenic landscapes; the very act of volcanism is supporting Kenya's bid in soft diplomatic power. Geothermal development is emerging as one of Kenya's enviable jewel at the deck of attractive ventures that turn our country admirable.

So how is geothermal, such hot stuff, found in the most unforgiving parts of the country rise as the star that glistens across the continent attracting reverence and admiration?

Sophistry in a unique component so admired and desired by others constructs a special mental and heart sensation that progressively builds attraction.

For starters, Kenya is towering in the geothermal front. In Africa, we are the most advanced nation that is commercially exploiting the resource.

Powering freedom

That is why, even recently when the President Commissioned the 140 MW in Olkaria, it was not just about costs of electricity. Nay. Kenya was sending a message to the world of her desires toward self-reliance, in diplomatic parlance known as self-help. Our President aptly capture it in the slogan, 'Powering Freedom.'

And when last November, as has been the case for the past nine years, 58 fellows from 18 African countries congregated in Kenya to learn about our geothermal technology. This training is under the auspices of the United Nations University Geothermal Technology Programme (UNU-GTP). Locally the Iceland-based UNU-GTP partners with KenGen and GDC.

And in all its benevolence, Kenya has opened her doors to the neighbours to come experience and learn. The Menengai Geothermal Project in Nakuru County for instance has become a poster child of how to develop a geothermal resource rapidly and cost effectively. Menengai, for friends and foe, is an epic triumph a nation got to be proud of.

In the comity of nations, having an upper arm in technology or the arts, is a source of influence. It is also good for the citizens who in most cases will be treated respecfully.

So why is Kenya a power when it comes to geothermal energy?

In Africa, it is only in Kenya that you will find commercial exploitation of geothermal energy. Today, geothermal accounts for 570 MW about 30% of the grid. Then, Kenya is home to an Independent Power Producer (IPP), we also have a special purpose vehicle – the Geothermal Development Company (GDC)-designed to specifically accelerate the development of geothermal energy in the country.

Rich History

Kenya has a rich history dating from the 1950s in geothermal exploration and development. Our rich tradition in geothermal is now an enviable national heritage. We have tried, faltered, rose up, learned and now we are on the trajectory to massively produce electricity from geothermal energy.

That is why the fellows were not short of the "Oohs..." "...wows!" "... ahas,..." as they went round the geothermal installation in he country. In Menengai, they were bamboozled, not because of the rapid growth of the project or the recently-struck mega wells, but the sheer commitment and strategy employed by the company, not to mention some of the finest geothermal brains in the world.

Now, with this technology, experience and development model, Kenya sits at an enviable perch when it comes to renewable energy. It explains why African countries in the EARS are looking at us for support.

Kenya has a rich history dating from the 1950s in geothermal exploration and development.

Centre of Excellence

This is why heads of state of the Northern Corridor Infrastructure Projects chose GDC as the regional Centre of Excellence. GDC is mandated to build the geothermal capacities of countries in Africa. (see story on pg. 22)

Then there is Tanzania, which has formed the Tanzania Geothermal Development Company (TGDC) modeled on the Kenya's GDC. Tanzania is banking on our scientists and experts, our insights and our strategy to support her bid for geothermal development.

Besides, other countries have sought GDC's expertise. This include Rwanda, Uganda, Ethiopia, Comoros, Yemen, Mozambique, Zambia and Malawi.

Africa, and indeed the global community, is gyrating towards green, affordable and reliable energy. It is pleasing to note that this burgeoning sector is the energy nectar.

The geothermal fraternity is glad to help Kenya advance its soft power when it comes to energy development from geothermal resources.

Many countries in Africa admire and even revere Kenya for her strides in geothermal investment and technology. It is such tiny aspects as admiration that form part of the fabric of a regional power.

Geothermal is furthering regional cooperation and therefore improving relations between countries. For instance Kenya was tasked to develop about 1000MW from geothermal energy to be distributed in the region. It has boosted our image and standing among nations. Kenya is today attractive in the eyes of those who seek our technology. No doubt that from the hot steams of our land shall Kenya rise as a regional power.

> The Menengai Geothermal Project in Nakuru County... has become a poster child of how to develop a geothermal resource rapidly and cost effectively.

GDC POWERING KENYA TO A GOLDEN AGE

Menengai Geothermal Project is easily the fastest developed in the world with unique models of selling steam to investors to generate electricity. Indeed, within five years, the first 105 MW will stream from Menengai, a world-beater by every stands, writes

ERIC WAMANJI

pg. 20&21

The bubbly future of Kenya is most likely rising from a dormant volcano. At the Menengai Geothermal Project in Nakuru, a constellation of seven drilling rigs tower the rugged landscape like titans, men are at work, and steam, massive steam gust from the earth with supremacy. It is this geothermal power that will give Kenya a competitive edge to fuel its economic aspiration.

Menengai Project is emblematic of growth in Kenya. One of the newest infrastructural projects in the country and, barely five years, it is set to spark its first electric currents at the end of the year. The Menengai Project creatively converges public and private money to boost electricity production in a model economist bet will haul Kenya to the golden age.

Phase one targets 105 MW by last quarter of 2015 to be generated by three Independent Power Producers (IPPs). It explains the flurry of activities at the caldera as scientists and engineers sweat to give Kenya its newest power project.

The success of the Menengai Project will translate to lower cost of electricity. The 105 MW is tipped to save the taxpayer a whooping Ksh 13 billion annually. This money would otherwise go to diesel to generate the same electricity. The Project will spur economic development and importantly give the country a psychological kick to venture into other areas of energy production.

The IPPs have signed the Project Implementation and Steam Supply Agreement (PISSA) with GDC for power generation. The three are Quantam Power East Africa, Orpower 22 (A consortium of Ormat, Civicon and Symbion) and Sosian Energy. Each of these companies will install a 35 MW power plant at the Menengai Project making a total of 105 MW net.

The agreements created the highest concentration of IPPs in the geothermal sector, and GDC has scored a global first; the world is watching.

"Attracting investors into national projects is critical to the economy. Menengai is a prototype of things to come because you know the substance of a thriving economy through its ability to attract private money," Paul Kimani a Nairobi-based economist explains to Steam.

The three investors have a guaranteed supply of steam for the next 25 years on the one hand, and a guaranteed power purchase agreement from KPLC for 25 years, on the other.

The IPPs will finance, design, construct, install, operate and maintain the plants on on a Build-Own-Operate (BOO) basis.

"We're confident about the Menengai Project that is why we're putting our money into it. We're going to support the government's bid of industrialisation," explains Ms Caroline Waiyaki, a director at Sosian Energy. So does Quantum Power East Africa Business Development Director, David Carroll, who confirms the construction of the power plants will be complete on time.

When this first phase is realised, Menengai Project will easily go down the annals of history as the fastest developed geothermal project in Africa, if not in the world. It explain the thrill that gripped GDC and the geothermal fraternity once the IPPs signed the agreements and moved to Menengai to get sites for power plants.

Pictured: The signing of the PISSA for Menengai's 105MW

105

Number of megawatts coming online by December 2015

"This is a major milestone in the history of geothermal energy in Kenya," enthused Dr Silas Simiyu, GDC's Managing Director and CEO upon inking on the dotted lines. "Today, we've firmed up a new, unique model that will see Kenyans enjoying affordable power from their geothermal resources."

Record breaker

The IPPs have moved to Menengai, in readiness to construct the power plants. GDC handed over three sites for the first 105 MW. In Menengai too, construction of Steam Gathering System will be completein June (See separate stories).

Making 105 MW in five years is a record-breaker. Energy projects are some of the most time-consuming in the world. Developing a green field like Menengai is no mean task. It takes years to carry out scientific surface studies, and more time to build a network of roads and water systems before moving in the rigs.

And to firm up the development of Menengai, the Board of Directors of the African Development Bank (AfDB) approved a $12.7 million African Development Fund Partial Risk Guarantee (ADF PRG) for the 105 MW Menengai Independent Power Producers project.

This risk guarantee is a major boost to the IPPs and the industry as it helps to buy down the risk for the private investors and demonstrates the buoyancy financiers have on the Menengai Project.

The ADF PRG will mitigate the risk to independent pow-

Pictured:
GDC's Director Sally Towett assist Quantum Power East Africa Business Development Director, David Carroll, to cut a ribbon to the power plant site in Menengai.

> The three investors have a guaranteed supply of steam for the next 25 years

er producers (IPPs) – and the providers of debt financing to IPPs – of non-payment by state-owned enterprise KPLC under the PPA and non-supply of steam by state-owned enterprise, GDC, under the PISSA.

The ADF PRG is a risk mitigation instrument that covers private lenders and investors against the risk of a possible government failure to meet contractual obligations to a project.

"By covering GDC steam supply obligations and KPLC's Power Purchase obligations associated with non-payment, the PRG is providing credit enhancement to the overall project structure, securing cash flows for repayment purposes for debt providers. This mitigation of perceived political risks will promote foreign direct investment in Kenya and "crowd in" private financing for power generation," reads a statement from AfDB.

Energy revolution

"The IPP concept is a win-win for Kenyans. We are going to witness reduced cost of energy and high uptake of electricity in the country. We at GDC are delighted to have developed a workable model that will revolutionise the way we generate our energy," Dr Simiyu explains.

And the revolution will change tariffs too. In Kenya, geothermal is the cheapest of energy sources after hydroelectricity in terms of cost and is unrivalled when it comes to reliability. While diesel-generated electricity trades at Ksh 22 kwh geothermal will trade at Ksh. 5 kwh. To cut the costs further, GDC deployed its own rigs and used local experts to develop Menengai. This approach alone has cut down the cost of drilling by 40%.

Traditionally the geothermal field developer is normally the generator. Yet you cannot always live in tradition. Such a model is unfeasible for our setting because it calls for heavy capital investment and ignores the opportunity cost of letting the steam lie idle awaiting confirmation of all steam

It is then that GDC invented a customised regime of selling steam to IPPs. This way, more investors are now looped into the geothermal enterprise and speed up power generation. This indomitable spirit has seen Menengai is steaming ahead. Just started in 2011, five years down the line electricity will be streaming from the caldera.

The Menengai geothermal project is being undertaken at a time when Kenya is on the cusp of an industrial rise. In such an era, reliable and competitively priced energy is non-negotiable. It is why geothermal energy occupies a venerable space in Kenya, currently contributing 30% of the grid electricity. Further, geothermal will cut tariffs by 30%.

GDC GOES BIG IN TRAINING AFRICA

GDC establishes the Africa Geothermal Centre of Excellence (AGCE) and starts to train geothermal experts from the region

By Eric Wamanji

On a bright July afternoon in Nakuru, Geoffrey Mibei collects samples of small grainy rock cuttings. He rinses them, and then inserts them in one of the machines in this laboratory. Then he waits for results.

The X-ray florescence (XRF) is a top-of-the-chain equipment.

"It is used in elemental and chemical analysis," says Mibei, a geologist. "From its analysis you can know the extent of chemical composition that is in a rock. That way, we can determine next course of action or even the scope of a geothermal resource," he explains.

This equipment is just a pointer of the strides GDC has made to fashion itself as the embodiment of excellence in geothermal development in Africa.

The Northern Corridor countries have affirmed GDC's strategic position as much. Recently, in one of the protocols mooted by the EA States, GDC will spearhead the geothermal front of the region. GDC has already established, and is operating the Africa Geothermal Centre of Excellence to be based in Nakuru.

The first batch of 19 fellows completed their four-week intensive training last October. The fellows came from Uganda, Kenya and Tanzania. The second batch of trainees joined in January 2015.

Evaluation of geothermal development plans for the Eastern Africa region which comprises 13 countries reveal that over 3,000 MW is planned for generation by the year 2025. GDC targets 2, 000 MW additional by 2020. These development require a large number of well-trained and experienced geothermal technologists to run the projects.

Indeed, when the African Development Bank (AfDB) described GDC as a 'Centre of Excellence,' sometime last year, it was clear that someone was taking note of all the effort, passion and determination that had gone into building the company.

Above: Geoffrey Mibei, GDC Geologist placing field samples into a sample holder for rock elements analysis by an X-Ray fluorescent machine at the GDC labs

The bank's leadership in the East African region noted that GDC had demonstrated extraordinary capabilities in establishing a solid and progressive geothermal culture.

Mr. Gabriel Negatu, AfDB's Regional Director for the East Africa Resource Centre, noted that the bank was in talks with development partners like the United States Agency for International Development to facilitate the replication of the GDC model.

"GDC is now considered a center of excellence in Africa and AfDB is in discussion with development partners to facilitate representatives of other African countries to visit the company and learn," said Negatu.

GDC is a recipient of AfDB's loan for the development of the first 400 MW in Menengai. And to understand this kind of excellence, you need to take a ride to the Menengai Geo-

Feeling the heat: Some of the fellows in a past field training feeling the heat of a fumerole in Menengai

thermal Project based in Nakuru about 200 kilometers west of the capital. Here, machine, man and nature are in a confluence that seeks to emancipate the country from the perennial energy shortages.

The AGCE will undertake training in all aspects of geothermal energy development, promoting research, sharing of equipment and expertise in the region. GDC has the task of identifying priority skills for rapid development.

Additionally, regional states have identified the importance and need to tap from the vast geothermal resources in Kenya. A regional technical meeting from the region is looking into ways in which the Republic of Rwanda can immediately tap up to 50 MW from Kenya drawn from geothermal resource. The power sale will commence in late 2015 upon completion of the Kenya- Uganda-Rwanda transmission line. The team is already working on drafting a Public Private Agreement and requisite regulatory arrangement needed to enable wheeling of power to Rwanda.

Today, GDC boasts of seven drilling rigs. These rigs provide a perfect ground for Africa to come learn and experience the science of geothermal drilling at its best.

That is why the Government of Kenya is fast-tracking the establishment of the institute that will automatically make GDC a geothermal hub in Africa.

And the person driving this agenda is no less a person than the Cabinet Secretary in the Ministry of Energy and Petroleum, Mr. Davis Chirchir.

Mr. Chirchir stresses the need to fast-track human capacity development in Kenya for the nation to realize its dream of adequate energy and subsequent economic growth in line with Kenya's national development plans.

"The Kenya Government has already given GDC some funds, part of which have already been used to acquire 100 acres of land in Nakuru for the development of Geothermal Centre of Excellency," says the CS.

"When we come up with models worth replicating, and when we provide all the core platforms for understanding and practicing geothermal enterprise, we have in essence established a Centre of Excellence," says Dr. Silas Simiyu, the GDC MD and Chief Executive Officer.

Indeed GDC has distinguished itself as an incubation centre for Africa's geothermal dreams. The laudable Menengai project and the move to other fields, puts GDC at a strategic stead.

"We are a complete laboratory," Dr. Simiyu continues. "Our very geological design is great for other countries to come and study geothermal development. Our systems too and operations provide Africa with a one stop shop for learning this science," he says.

"There is a big demand in Africa to understand geothermal energy," says Phillipe Niyongabo of the Africa Union. "We need GDC to firm up the facilities so that many experts can benefit."

Niyongabo is glad that GDC is home to Africa's finest brains on geothermal energy. "Africa needs to tap on this experience. That is how we can develop," he explains.

The Centre of Excellence is also being supported by AUC, JICA, AfD, ICEIDA, USAID and United Nations University-Geothermal Training Programme.

In mid last year, during the donors coordination in Reykjavik, Iceland attended by ICEIDA, AUC, GDC, KenGen, AfDB, World Bank, USAID, NDF, ARGeo/UNEP and UNU GTP, it was resolved that the centre has to roll of as a matter of urgency.

Ludvick Georgeson, the Director UNU-GTP is upbeat about the center. "That's a great initiative by heads of state," he says. "That's how Africa will rise once you have expertise."

Besides the Centre of Excellence, GDC is also engaged in the annual UNU GTP training that takes place every November. Last year's, the training its 10th edition attracted 58 fellows from 18 countries.

Meanwhile, in the laboratories, Mibei is taking his readings from the XRF. He is a privileged geologist who is operating such unique equipment. And he is buoyant, "there is room for many consultancy jobs to be done with this equipment. It will support the Africa geothermal dream," he says.

> "The northern Corridor countries have affirmed GDC's strategic position

Treasures of Silali attract risk mitigation funds

On the trail of Northern steam...GDC geophysicists during an exploration mission in Korosi prospect in the North Rift area. The prospect is found at the Baringo-Silali block where GDC will develop 200MW by 2016

By Eric Wamanji

Baringo-Silali geothermal block does not have a snap hint of the wealth buried more than a kilometer deep in the soil. To the passive eye it is desolate, interspersed by hills, cactus, acacia or the infamous mathenge shrubs prosopis juliflora and volcanic formations like faults, a lake and rolling hills. The sun scorches here as if in retribution such that even flies scramble for shelter. The ground is hot and the monotonous bleat of goats as they nibble shrubs makes a dreary day for visitors.

But do not write it off yet. It's a world of contrasts. Mornings and evenings are gorgeous, and the tapestry of geographic formations washed by soft beams of sunrise or sunsets create breathtaking vistas for the photographer's lens.

Still, this is a world of great fortunes. It is home to the Silali Geothermal Prospect, which is headed for a major transformation. GDC has received a grant of USD 6,026, 786 to initiate geothermal development in the region. The funds will go to the drilling of two exploration wells, development of infrastructure for the Baringo-Silali Phase I Project and continuation premium for the third well.

Turning point

The grant from the Geothermal Risk Mitigation Facility (GRMF) is a component established by the African Union Commission (AUC), the German Federal Ministry for Economic Cooperation and Development and the EU-Africa Infrastructure Trust Fund in cooperation with KfW.

> The Baringo-Silali block is one of Kenya's Eldorados ... It has a potential of about 3000MWe.

The announcement of the funds heralded a major turning point for Kenya's geothermal sector. It will provide a catalytic pedestal to accelerate the development of a resource that Kenya's rapidly expanding economy requires for takeoff.

"The GRMF financing will not only mitigate the high upfront geothermal exploration risks, but also improve access to equity or other funding source and thus play a catalytic role in establishing geothermal energy as a strategic option in power expansion planning of the country and other Eastern Africa countries," explains Dr. Silas Simiyu, GDC's Managing Director & CEO.

Indeed, the funds will profoundly shrink the risks and costs for early-stage geothermal development. This way, it will

GDC staff carrying out field exploration studies in Silali.

be much easier to encourage the development of further geothermal investments through financial mobilisation. At the end, it becomes a win for Kenya with reduced energy costs.

The grants are awarded on the basis of the proposed projects' geological, technical, economic and financial viability and environmental acceptability. According to scientific figures, the Baringo-Silali block is one of Kenya's Eldorados in relation to geothermal energy. It has a potential of about 3000MWe.

Project applicants are required to provide sufficient data and analytical reports regarding the geothermal prospect. GDC conducted one of the most rigorous scientific survey of the region in 2010 that proved the extent of the resource.

Track record

Besides, the funds are coming to a company whose track record in Menengai speaks for itself. GDC is home to Africa's most accomplished geothermal experts whose tabs on geothermal energy go several decades back.

That is why GDC was confident when it applied for the grants in 2012. This was just soon after the launch of the First Application Round.

The GRMF financing is premised on the ideal of stimulating geothermal development in Africa. It is anticipated that once a resource has been proven, it will be easier for governments or private sectors to develop the fields.

GRMF: SNAPSHOT

- GRMF grants cover Infrastructure costs, Surface studies, Exploration drilling and testing programmes as follow:
- Infrastructure grants: GRMF grants covers 20% of approved costs for infrastructure required for eligible surface studies or eligible reservoir confirmation wells (e.g. access roads, water, power)
- Surface studies grants: GRMF grants covers 80% of approved allowable costs (excluding infrastructure costs).
- Drilling grants: GRMF grants covers 40% of approved allowable costs for the drilling and testing programme for reservoir confirmation wells (excluding infrastructure costs).
- Continuation Premium: GRMF grants covers 30% of the developer's share of the approved allowable and expended costs for the drilling and testing programme in case developers continue to drill an additional reservoir confirmation well.

"The objective of GRMF is to encourage public and private investors (developers) to develop geothermal prospects in GRMF eligible countries by providing financial support to assist in mitigating the high upfront geothermal exploration risk," Dr. Simiyu.

Indeed, most investors shy from betting their dollars on green fields because of fears of losses should they strike dry wells. However, they are ready to come on board once they are assured of the resource availability.

"The procedures for the grant application begin by project developers applying directly to the AUC through a competitive, transparent and rigorous two-stage Application processes," says Dr. Simiyu.

The first stage of the Application procedure is the submission of the Expressions of Interest (EoI) followed by mandatory pre-bidding workshop for developers whose EoI score over a certain threshold. In the second stage, the short-listed developers submit full Applications, while the third stage involves grant award, negotiations and signing.

During the first application round, GRMF requested for applications from five countries (Ethiopia, Kenya, Rwanda, Tanzania and Uganda), but has since been increased to 11 East African rift countries for second round to be concluded in 2014.

Critical milestone

The six additional countries include Burundi, Eritrea, Comoros, Democratic Republic of Congo, Djibouti and Zambia.

"The Commission was pleased that GDC's application was successful and that they look forward to the project being completed on time," explains Dr. Simiyu.

The GRMF contract between GDC and AUC is signed and implementation is planned to commence when the well pads in Silali will be constructed. Drilling under this program is planned to commence incoming months.

Opening up of this block is a critical milestone for GDC as well as the country. This will be part of the 5000+ megawatts in 40 months, being driven by the Ministry of Energy and Petroleum. Besides, the availability of electric power here will be the surest way of unlocking the region for economic development.

Hon. Gideon Moi, the Senator for Baringo County is upbeat that the area which is rich in livestock, honey and irrigation projects will attract processors once availability of power is guaranteed.

'That's how to devolve wealth," Hon. Moi told *Steam*. "I'm pleased that GDC is committed not only to its mandate of energy development for the country but also for its focus on the local man in the village. This geothermal will change lives here completely."

The GRMF boasts of a grant bunker of €50 million to be utilised over a four year period (2012-2016) with at least three Application Rounds expected to be done over the period.

It is a risk fund that will end all risks.

Private money in steam power

105 MW to save country Kshs. 13 B annually

Three Independent Power Producers (IPPs) have now moved into Menengai setting the process to generate electricity from geothermal steam.

At the close of 2014, GDC handed over power plant sites to the three IPPs: Quantum Power East Africa, Orpower Twenty Two (A consortium of Ormat, Civicon and Symbion) and Sosian Energy. Each of these companies will install a 35 MW power plant at the Menengai Project making a total of 105 MW Net.

The IPPs, some with a long tradition in geothermal power generation locally and internationally, have given Menengai a big boost as a model project. They are going full throttle to square out the once seemingly insurmountable matter of fuel adjustment levy on electricity bills.

Commitment

The elated IPPs reaffirmed their commitment to deliver on the part of the bargain.

The 105 MW phase one expected to roll out from Menengai is part of the 5,000 MW+ project expected to be complete by the end of 2016. The Plan is mooted and spearheaded at the Ministry of Energy & Petroleum. Mr Davies Chirchir, the CS in the ministry, is directing the project. GDC is set to generate 810MW in the same period.

Geothermal is a natural fuel that has no recurrent costs once it has started to generate electricity. Each year, the country spends about Ksh 45 billion to buy diesel for power generation. The quick coming of Menengai will enable the country to displace some of the diesel-generated electricity.

Open for business...Caroline Waiyaki a director at Sosian Energy cuts the ribbon at the Sosian site at the Menengai Caldera. Looking on is GDC's Board Chairman Faisal Abass (second left) as well representatives from the other IPPs who will be constructing power plants for 105MW at the Caldera.

> The rise of Menengai is a world-beater in terms of speed of implementation and the cost-effectiveness of the development model

But the electricity from diesel is too punitive costing up to ksh 22 per kilowatt hour, yet, with geothermal the rates drop to about ksh 5 – ksh. 7 per kilowatt hour. This is because we spend our currency to import the diesel which in turn is used to heat water to produce steam that will generate electricity. With geothermal it's a different ball game; the water is already superheated by Mother Nature, and what we need to is to extract it and it will produce electricity to near-infinity.

PISSA

This new development comes in the wake of the three IPPs having recently signed the Project Implementation and Steam Supply Agreement (PISSA) where GDC has guaranteed the supply of 105 MW of steam. They also signed a Power Purchase Agreement with Kenya Power.

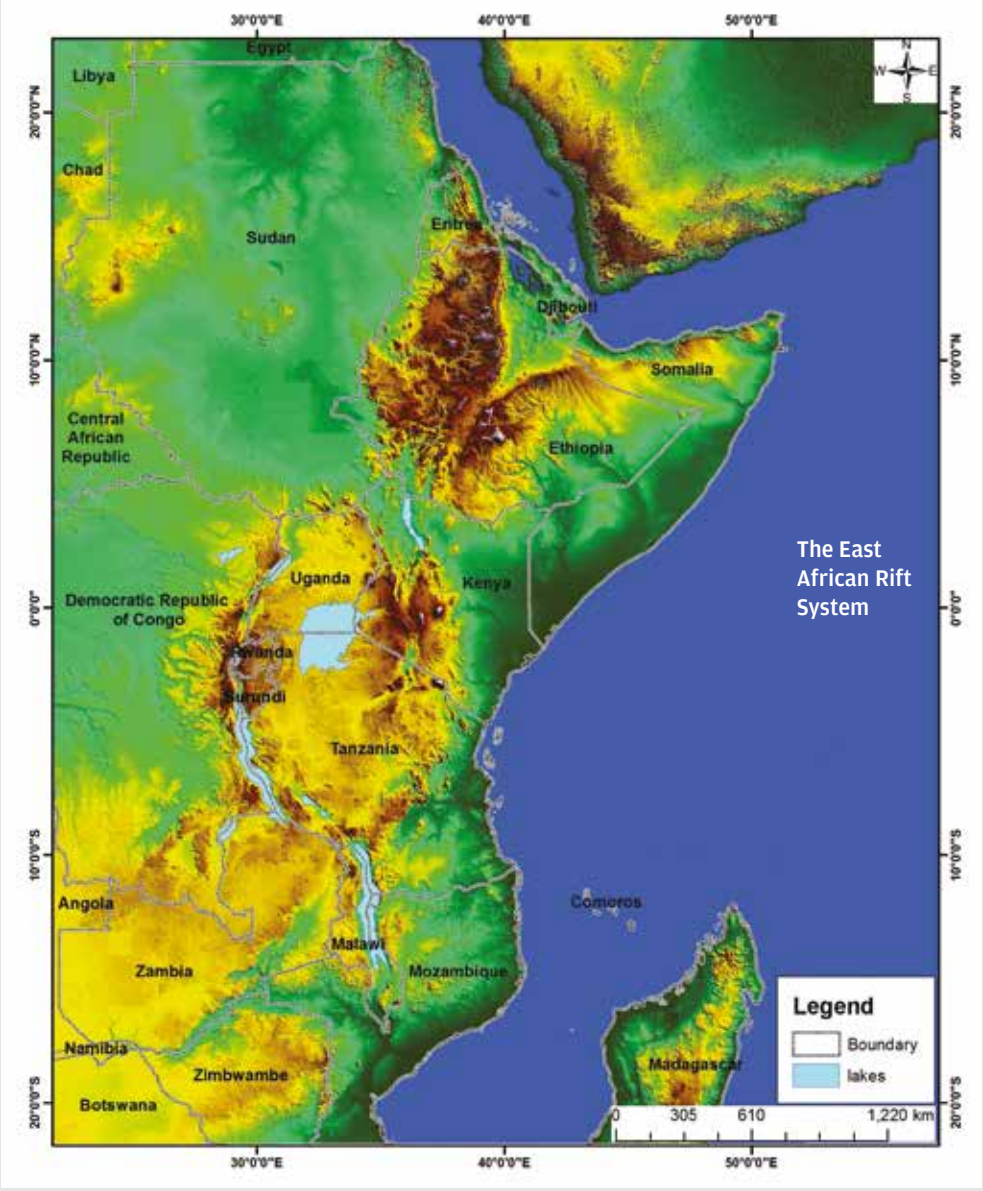
GDC is also developing 360MW more in Menengai. It has also started operation in Barigo-Silali where the KfW of Germany has given Ksh. 9.6 billion for the drilling of 20 geothermal wells for the production of 200MW. GDC is also preparing to open up the Suswa geothermal field.

The success of this model will open new investment opportunities for other potential IPPs who will be spoilt for choice as to where to put up the power plants.

Record-beater

The rise of Menengai is a world-beater in terms of speed of implementation and the cost-effectiveness of the development model. Ideally geothermal projects take ages to mature, even here in Kenya. Such long gestation periods rob the public an opportunity to access electricity, and the country opportunity to power its economic aspiration.

The GDC model however is a product of careful analysis of the country's needs, the past history in our geothermal development and what has happed elsewhere in the world. Then, the team crafted a smart model integrating the private sector in the government's plans.



Raft of proposals from ARGeo Summit

By GODFFREY OLALI

Global geothermal experts who recently converged in Arusha, Tanzania for the fifth edition of the African Rift Geothermal Conference (ARGeoC5) rolled out a raft of resolutions which will tilt East Africa's geothermal development in a big way.

The three-day summit brought together regional geothermal brains mainly from key African countries sharing the Rift Valley. In attendance were also geothermal professional from Europe, Japan and the United States of America.

The Arusha summit resolved to devise a policy each to guide the establishment and development of the resource in East Africa – which is quickly becoming world's geothermal attraction belt.

The meeting also supported efforts to put up the Africa Geothermal Centre of Excellence in Nakuru, Kenya.

GDC is already at advanced stage in setting up the Africa Geothermal Centre of Excellence at its Kabarak land in Nakuru County(see separate story on page 20 and 21)

During the summit, African countries sharing the Rift Valley also launched a database for geothermal records. This, according to geothermal experts, will be a critical pillar in geothermal research. The platform will also offer an avenue where professionals can share and exchange ideas.

The chief executive officer with the Geological Survey of Tanzania (GST), Prof Abdulkarim Mruma, said the database would consist of information on geothermal expertise, and equipment.

ARGeoC5 attracted about 500 energy experts, policy-makers, and financiers from across the world at the Arusha International Conference Centre.

The summit was organized to promote the development, exploration, use and financing of geothermal energy projects.

Themed 'Geothermal: Solution to Africa Energy Needs, ARGeo - C5 main conference featured a range of sessions geared toward exploring, risk mitigation, attracting private developers, fast-tracking projects, stimulating the growth of the industry through investment and the development, construction and operation of geothermal plants.

Participants also took part in short courses, in the areas of drilling and financing.

The African Rift Geothermal Development Facility (ARGeo) has been the major architect behind the summit. In 2014, ARGeo-C5 was facilitated through the partnership with the United Nations Environment Programme (UNEP) and the Government of Tanzania. The UNEP-ARGeo Programme is a project funded by the Global Environment Facility (GEF) that encourages the development of geothermal energy sources in East Africa to realize their untapped potential and reduce greenhouse gas (GHG) emissions. It was officially launched in 2010 at ARGeo - C3.

Speaking during the conference, Tanzanian Vice President Mohamed Gharib Bilal said exploitation of geothermal power would go a long way in realising Tanzania's ambition of becoming a middle economy by 2025.

Dr Bilal called on foreign direct investors to invest in the geothermal areas in a bid to boost the country's power generation from the current 2,780 megawatts to at least 10,000 megawatts required for realising its Vision 2025.

These, he noted, will include ways on how to mitigate risks associated with geothermal exploitation, attract private developers to fast-track the resource development, and to effectively develop, construct, and operate successful geothermal power plants.

By Erick Wamanji

DAY GDC WOWED SENATE

It is a congress of wise men. Majorly drawing finesse, panache and insight from long years of debates polished at the August House. And now when honourable members of the Senate talk, it is foolhardy to ignore their pearls of wisdom.

This explains the sobriety and passion with which they animatedly contributed to the report on Geothermal Energy as tabled by the Energy and Roads Committee. The February afternoon debate in a nutshell was a report card of 'Excellent; keep it up!" for GDC.

Basically, if they had the cheque book, the Senators would have given GDC a blank leaf to go and accelerate the development of the resource so that Kenya could unshackle itself from the yorks of high energy costs and attendant problems.

"Mr. Speaker, Sir... I would like to support the GDC and urge the government to give them funds so that they can exploit areas which were long forgotten. Baringo, Turkana and Samburu will become a silicon valley once geothermal is exploited," Sen. Sammy Leshore noted, his eyes scintillating, seemingly excited by the vision of a citadel of energy and technological greatness promised by geothermal energy.

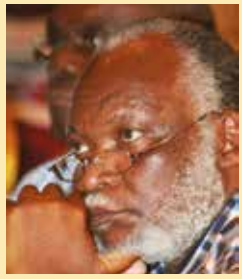
The senators left no doubt of how much primacy they placed on geothermal energy and its chief developer GDC. They also demonstrated a mastery of the sector, actors and processes in a most admirable fashion.

While seconding the motion, Sen. Dr. Machage invited Kenyans to develop appetite for geothermal investment. While on his part, Sen. Mositet urged the Ministry of Industrialisation to work closely with GDC for planning of industries in the regions. While the Counties will be the biggest beneficiaries, senators urged them to develop infrastructure for GDC to execute its mandate with ease.

Sen. Eng. Muriuki must have taken a lot of pride in learning that GDC is developing a new generation of geothermal engineers. To him, once we have this pool of experts, the region will come to learn from Kenya. What a pride that would be?

Sen. Gideon Moi: Chairperson

Sen.Danson Mwazo: Funding



Sen. Wilfred Machage: Private investors

Sen. Charles Keter: Right man

Sen. Prof. Peter Anyang' Nyong'o: Carbon Credits

Sen. Godliver Omondi: Turning point

Sen. Peter Mositet: Good job

Sen. Moses Wetangula: National pride

Sen. Sammy Leshore: Support

Sen. Muriuki Karue: Training

Engineer seemed to quip.

While supporting the motion, Sen. (Prof) Anyang' Nyong'o noted that "Geothermal is a very attractive investment as long as the government undertakes its counterpart responsibility."

"Not only will you get the carbon credits and so on, but the cost of energy consumption will go down drastically," the good professor noted, giving a picture of an elder offering advice to a council of elders.

He called for continuity of management in a bid to realise such a grand dream as is the geothermal development that Kenya has embarked on.

"If you read the history of several countries which have made it rather fast in development, like Malaysia, Singapore, Korea and so on, which we always

quote, you will find that when they have an initiative like this, the government must be stable and professional," the good professor observed.

He went on meticulously and steadily like a surgeon performing a laser operation: "But when you start something like this and every now and again change... somebody is just settling down in the office and they are going away- they go away with a collective memory, contacts that they have made with investors and goodwill that they have built," he cautioned.

Well-versed in geothermal, Sen. Keter took time to give a background of geothermal and the complex nature of its development. He could easily pass for a professor of geothermal technology. And why not? Was he not the Assistant Minister for Energy when GDC was being formed?

"The reason for the creation of GDC," Keter continued "was to cushion the government in terms of the investment, because the geothermal exploration exercise is very expensive," he explained to an attentive house.

"Mr. Speaker, Sir, the current Chief Executive Officer is an experienced person and has all the credentials. Also, the technical staffs are experienced. Dr. Silas Simiyu is a very ... experienced geothermal expert in Kenya. I don't think we have anyone else in this country like him," Keter extolled the undisputed C'zar of Kenya's geothermal enterprise.

For Sen. Omondi, it's about the big picture. "I think if this report is adopted and the implementers make use of it, it is going to help the larger population of Kenya to have power even at the lowest levels of living standards, and this is going to reduce the high cost of fuel and reduce deforestation, which will lead to improved living standard for Kenyan people."

To others like Sen Wetangula, it's about the national pride. "...I am very happy with what is going on in the geothermal sector--- if you fly over Lake Naivasha, Olkaria and the Menengai Crater, you will be amazed at the amount of work going on; the drilling of wells, capping of those wells and eventual generation of power..."

In total, 26 senators took part in the debate that lasted close to four hours. Indeed, it was an afternoon of serious national debate where GDC got a rare chance to be discussed, appraised and encouraged to deliver on its mandate.

"I would like all my colleagues in this house to support geothermal because it is the energy of the future," Sen. Leshore appealed fervently.

Others who debated

- Sen. Billow Kerrow- Mandera County
- Hon. Ekwe Ethuro- Speaker of the Senate
- Sen. John Munyes- Turkana County
- Sen. Bonny Khalwale- Kakamega County
- Sen. Yussuf Haji- Garissa County
- Sen. Wilfred Lessan- Bomet County
- Sen. Kiraitu Murungi- Meru County
- Sen. Kembi Gitura- Muranga County
- Sen. G.G.Kariuki- Nyandarua County
- Sen. Daniel Karaba- Kirinyaga County
- Sen. Kennedy Okongo- Nyamira County
- Sen. Henry Ndiema-Trans Nzoia County
- Sen. Kipchumba Murkomen- Elgeyo Marakwet
- Sen. Chelule Liza -Nominated Senator
- Sen. Beatrice Elachi-Nominated Senator
- Sen. Judy Sijeny- -Nominated Senator
- Sen. Janet Ongera -Nominated Senator

Senators during a visit to the Menengai Geothermal Project

Key recommendations

- GDC to discuss with the counties where they are undertaking the exploration and development, so that those counties can also invest in the technology of using water for domestic and commercial purposes.
- Develop clear policies on how to share the proceeds from carbon sales. the
- Investors to install well heads on wells which are ready, so that, the power can be provided to the national grid in the shortest time possible.
- We recommended that the government of Kenya should set aside adequate funds so that Geothermal Development Corporation can accelerate and undertake more exploration in the other counties of Samburu, West Pokot and Turkana.
- The county governments should also set aside land for setting up industrial parks near the geothermal resource sites. That would facilitate development of IPPs power plants and also provision of by-products from geothermal energy.

It's time for rig up!

By KIPROTICH BII

A rig is always a sight to behold. No matter how many times I visit Menengai, I am always amazed afresh at the sight of the gigantic structure. To see recollected drillers going about their business with practiced dexterity atop the rig floor is another source of wonderment. Add the humming noise from the machine as it drills, drill pipes being lowered here, someone moving pipes there…it is a bustling as well as confounding environment for any visitor.

But nothing could have prepared me for a sight that would welcome me to Simba 2 that Monday 17th February this year. It was unusually cold and wet for Menengai but that was not the strangest thing. The wellpad where the first directional well in Menengai will be drilled looked almost like the rest spread all over the Menengai Geothermal Field.

But as I descended to the wellpad, my number one attraction lay sprawled all over, like a city after being sacked by Spartan soldiers. A scrap metal dealer's paradise if you will. A crane was lowering a compressor from a truck; two men were guiding the heavy bogey-like object with tug lines. Careful and meticulous, all quiet.

I bumped into Stephen Nato, an engineer, and took to bombarding him with questions in the place of greetings. 'This is called a rig up. It takes about fifteen days but before that, we do a rig move plan for about fifteen days.' He knowledgeably replied to my questions.

The rig up, according to Ludasia Ochieno, another engineer in charge of the exercise, was about 55% done. But in spite of it more than halfway up, a layman like me would not know where any of the remaining parts spread around would fit where.

> Their actions were so facile; you would think they were fitting a mere jigsaw puzzle

"Are parts numbered? Do you fit the parts with bolts and nuts? Or how exactly do you know which part fits where?" Nato told me after years of working with the machine, it becomes part of them which parts fit where.

Armed with proper personal protective equipment, I moved closer to the action. Two cranes were adjusting what I was told was the two A-frames that support the mast. All eyes were turned to the progress it was making. When someone lifted a hand, it was all hands to the deck. They all rushed to fix the pins in place. When it was done, a modest cheer went up.

It is not dull in the team in spite of the weather and the enormity of the task they are grappling with. In fact their actions were so facile; you would think they were fitting a mere jigsaw puzzle. The only lady in the team that day, Sally Luvandere, a roustabout, was at ease just like the men. She exchanged a few pleasantries with me but with eyes fixed on the movement of the crane. I asked her whether the task was daunting. She told me it is a job that one gets to love and learn by heart.

At that point, the substructure was up. The gen-sets (generators) were in place, the barracks were also in place, the compressors, the mud tanks and other things whose names I could not muster, were not. I was told the reference point is the cellar, which is the place where the well-head will be constructed. Everything revolves around it. By the time I was leaving, the A-frames were going up. Another monster was gingerly coming up again to rule the Menengai skyline. In my heart, I was suffused with profound respect for the men and women who 'rig down', 'rig up' and 'rig move' them whenever it is time to do so.

Big up to them!

How I took the next step

Florence mashipei tells Deborah Kalei

I was so scared to open the letter when I was called to the HR office, but curiosity got the better part of me. Shaking hands, my heart throbbing inside my chest, and beads of sweat on my face, I quickly skimmed through the contents of the letter. I was ecstatic; I couldn't stop the tears. The letter informed me of my placement as an Assistant Performance Analyst. I had been working in GDC for some time as a tea girl.

First things first, I called my mum who was totally over the moon with joy! It was very exciting for her to see her daughter get something she had wanted for so long.

My journey to Performance Management kicked off back at home in Kajiado where I was born and raised. Folks at home did project management. Back then projects were not my passion, but I had seen so many people come up with projects and succeed. I chose to follow in their footsteps and joined the Institute of Community Development for my studies in Project Management and Community Development.

On completion of my college studies, I worked with World Vision where I did data collection and analysis in Kajiado County, my home county. Later on, I moved to the Upendo Children Rehabilitation Center in Westlands where I worked as a secretary. I was however called upon to do project related assignments, providing an avenue for me to apply my project management skills. With hindsight, I can't help but think that the path to becoming a performance analyst started back then, way before I knew that I would be here today.

Soon, another job came beckoning; this time it was a casual job as a tea girl at GDC. This was in 2010. I was later confirmed as permanent employee in 2011. Though happy that I now had a permanent job in one of the most coveted companies, I was aware that working in the kitchen was not necessarily a direct path to a conventional regular office job. That's when I decided to take a different step.

I had many people looking up to me to set the pace, not just among my siblings, but in the community at large. I knew I had to do something for myself so I enrolled for a HR course. I chose to deviate from project management having always had a passion forHR.

Working and studying is not easy by any standards. Long hours in Nairobi'sfrustrating traffic jam, late night classes coupled with long session of extended study time that stretch into the wee hours of the morning doing class assignments can take their toll on anyone. I was no exception. On seeing that it was not easy to do both school and work concurrently, I realised that something had to give way. I chose to take Saturday classes which ran from 8:30am to 5:30pm, except for a 30 minute lunch break.

Then my hard work paid off sooner than I had expected! In 2013 when the Corporate Performance Department put up an internal job advert, I was on leave, but as fate would have it, I came back before the period of application lapsed. The position required experience in HR, Project Management and Data Analysis, which I had acquired in my life's journey.

I fiddled with the question in my mind, pondering whether I could actually rise from my position as a tea girl to become an Assistant Performance Analyst. Eventually, I took a leap of faith and put in the application. The rest, as they say, is history. I got the job!

It has been a year now since I was appointed to my new position. As I now settle down to do what I have always wanted, I am happy that I am adjusting well. My colleagues at Corporate Performance Management department have graciously taken me under their wings, helping me hone my performance analytical skills.

But this is not the limit for me, not in the least bit! I am currently pursuing my bachelors degree and in the next few years I'll have a Master's degree as well. My mantra is simpe: dream big and be patient. Success will come, one step at a time.

The tango that's leadership

by Irene Onyambu

The term 'leadership' tends to create the misconception that it is entirely to do with the 'leader' and little if any to do with the 'lead'. However, without 'followers', there is no 'leader'. To understand the relationship between the leader and follower, it befits a definition of this term- leader. So who is a leader?

A leader is simply someone who influences others to follow him or her in order to achieve a specific goal or outcome. Influence happens when there is an intersection between leadership and followership. At this intersection, a leader's expectations of followers are fulfilled while on the other hand, followers see and experience their expectations of the leader.

For this magic to happen, a few ingredients should be brought to the broth both by the leader and the follower. The most critical of these ingredients however, is communication. A good leader must communicate effectively to his followers.

A good leader should also be open and honest with those he/she leads. This is because leaders are watched all the time by subordinates hence making honesty and ethical behavior a key value. It is worth noting that the behavior of the follower is often a reflection of his/her leader.

Trusting subordinates in the execution of their duties is key to fostering team spirit

and team work. Followers want to feel valued and trusted. One sure way of showing this is through delegating duties and tasks to them.

Finally, as a leader, it is important to continually instill positive energy even when things are falling apart and nothing looks encouraging. Though guiding a team through turbulent times without panicking is challenging for the leader, it should be done if follower-morale is to be maintained. Followers will connect with a leader who encourages them to laugh at their mistakes rather than cry.

So much for the leader.

On his/her part, what does the follower bring to the pot? The first quality is that of self-management. A follower should be able to think critically, to be in control of their actions and to work independently. Secondly, Leaders want to have followers who show commitment to goals and objectives of the team and the organization at large.

The third desirable quality of followers is competence. It is essential that followers possess the skills and competencies necessary to complete the goal or task of the group, team or organization. Further, a leader wants followers that continue their pursuit of knowledge by upgrading their skills through classes and seminars.

Effective followers should have courage and remain steadfast on their beliefs. They should persistently maintain and uphold ethical standards, even when everyone around them is dishonest or corrupt. These individuals are loyal, honest, and importantly, candid with their superiors.

Last but not least, a good follower should be willing to obey the leader. A good follower should understand his subordinate position and learn the likes and dislikes of his/her leader. A follower should understand his environment and recognize that taking a particular standpoint, for example, is not winnable and will only result in delayed delivery of results. An effective follower should be able to recognize that on occasions the boss might need help, even when the boss himself/herself might not have made such recognition.

Always bear in mind that those who turn out to be the best leaders are those who have previously been the best followers.

Onyambu is the General Manager, HR at GDC

Are the "NEXT OF KIN" details in y

by Mariam Yunus

The year 2005 was remarkable to Mr Kalila, he just landed himself a lucrative job in a well-established Company. All this he attributed to his parents who gave him a good education. The only regret he labors is that his mother passed on before he could share such blessings with her. Anyway he thanks God since his father is still alive although as years passed by he got himself a young wife, which

is a norm in the society he belongs to.

As Kalila was filling the HR forms, he provided his father as the next of kin since he was still single. His father died one year later and by then Kalila had got married to a beautiful wife and got his first son soon after. However he did not advise HR to update his next of kin to reflect the new status.

On a separate case, Ms Melody provided her husband as her next of kin, however things did not work out and after three years in marriage they divorced and she got

Navigating risk management

by ROSEMARY OLONDE

Risk is part of life. In fact everything we do in life has an element of risk. Still, risks need to be managed. In the corporate environment, risk management must be an integral part of doing business. And as a business grows, risks change and risk management processes likewise evolve.

As a company we have trodden the risk management path slowly but carefully and have made good progress. GDC now has developed and adopted a Risk Management Policy and an integrated risk management framework where risks are coordinated across business areas. Monitoring, measurement and reporting are also done.

Risk Management is the process of systematically identifying, quantifying, and mitigating all risks and assessing their impact so that corrective actions are taken promptly to ensure the achievement of corporate goals and objectives.

Risk assessment involves the evaluation of the process of risk management and provides assurance that the risk management process is sailing in the right direction.

Risk management helps a company forecast uncertainties related to the achievement of its objectives and prepare mitigation measures. These uncertainties can be potential obstacles but they could also be opportunities. While obstacles can erode business value, opportunities presented by well managed risks can enhance value. Obstacles can range from loss of key personnel, losses due to a natural disaster, losses due to theft or losses due to disclosure of confidential information. Risk opportunities can arise from a competitor's failure. Risk needs to be managed continually as risk levels change and new risks emerge. By managing uncertainties, a company is able to improve in its achievement of strategic goals and objectives.

> *Risk management helps a company forecast uncertainties related to the achievement of its objectives and prepare mitigation measures.*

Globally, the ISO 31000:2009 global standard sets out principles for effective risk management as:

- Creating and protecting value.
- An integral part of decision-making
- Explicitly addresses uncertainty
- Based on the best available information
- Dynamic, iterative and responsive to change
- Tailored to suit the company's needs.

Our next steps will be to review our risk culture to assess

Success and risk are related. It is the level of preparedness one is that determines a company's level of success in risk management. In GDC the risk management journey is on course.

Olonde is the Manager, Audit, Risk and Compliance at GDC

our HR file up-to-date?

married to someone else, she did not advice HR to update her file on the new status.

Such cases are very common in our Organization and they pose a major strain and legal proceedings to the families and the employer should the employee die while in employment.

Keep in mind that as much as the Law places the burden of keeping records on the employer, it is your personal responsibility to quickly upgrade your details in case of any change of status including Marital Status, getting a child or even upgrade in education.

Without an up-to-date record, a Company will not be able to identify beneficiaries in case of death, when that happens, an employer will most likely transfer the employee's benefits to a public trustee. Or for the case of Mr Kalila and Ms Melody, the benefits will end up with a person who was not intended.

The update in case of an upgrade in education is important in case the company needs to make certain critical decision like training, promotion or Job rotation.

As the new year has just begun, make the update of your HR file a priority and ensure that you do this at least once in a year.

Yunus is the Manager, HR Planning, Resourcing & Performance at GDC

How Nimo potted her way out

By Natalia Njoroge

Accused of being a cocaine user, an administrative assistant storms out of the office for good. Was there a better way to handle the situation?

When Nimo Wairimu started her job as an Administrative Assistant at a government institution, she seemed to come with no liabilities. "She got to work on time, worked steadily, dressed professionally, and always double-checked her work," recalls he immediate boss, Lucy. "She was meticulous and reliable in every way."

About a year into her tenure, however, her behaviour became strange and inconsistent. Although she still finished her projects on time for the most part, she started arriving late and calling in sick frequently. "It was always a different excuse," says Lucy. "One day it was the traffic, another day there were no matatus and once she 'stated that she did not hear her alarm clock.' I noticed that a lot of her "sick days" fell right around the time she'd get her salary. We'd ask her how she was feeling after she came back to work. It would always be, 'Oh, I'm fine. It was just a 24-hour thing."

After her absences, Nimo would sometimes make up time by working 16-hour days. Co-workers appreciated her dedication, but the inconsistency was a bit alarming.

Borrowing money

A few months later, Nimo's salary suddenly seemed inadequate. She borrowed Ksh. 5,000 from Jane, one of the account executives. Nimo's story? I need to fix my water heater in the house. That's why I've been late. It takes forever to get ready for work, just because I have to light the jiko to warm my bath water, I can't take a cold shower, the doctor told me it is not recommended."

"It sounded a bit strange, Nonetheless, Nimo had never asked me for money before, so I figured there must be a good reason," says Jane. "She was very grateful. She thanked me profusely and promised she would make it up to me soon. But it turned out she'd also borrowed money from Tom, and both of us are still waiting to be paid back, three months later.

The call to action came about four months into the bad behavior, Nimo was now very short tempered, and she was not getting along with any staff member." When Lucy spoke to Nimo about it, she said she was terribly sorry, that she was grappling with a caffeine problem and would cut down on coffee to even out her mood. Still, Nimo's mild temperament was giving way to frenetic mannerisms.

Bathroom Confrontation

The final straw was one late night when Lucy stopped by the office late to pick up some papers and surprised Nimo in the ladies room, where she saw her sniffing a white powdered substance on a compact mirror. "Oh, Lucy," Nimo stammered. "I just crushed some aspirin. I can't swallow whole tablets. I have a migraine." Suddenly, everything about Nimo's changed behavior seemed to make sense.

The next morning, Lucy thought that she would circulate information she had from NACADA to Nimo on drug abuse awareness creation.

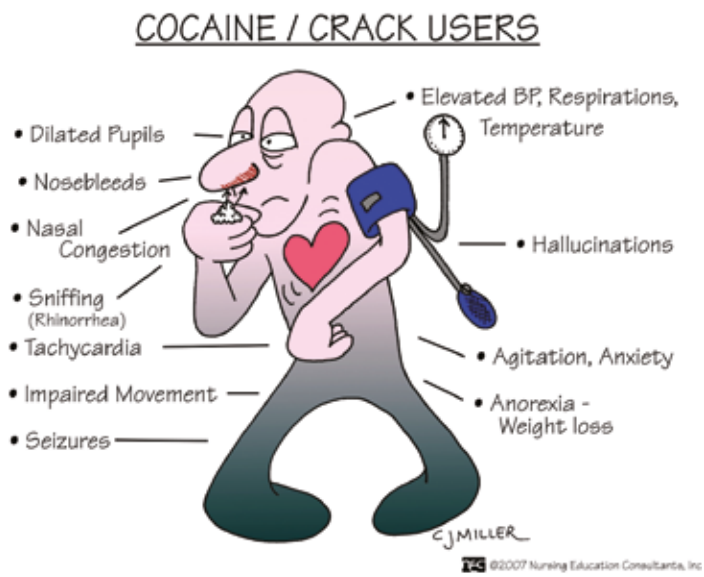
Although Nimo read the email and never mentioned it, they seemed to scare her straight for a total of three days. After that, the same pattern emerged: lateness, inconsistency, frenetic mannerisms, and more tales about why she needed to borrow extra cash. Lucy called Nimo into her office. "Nimo," she said. "I normally don't get involved in my employees' personal lives, but clearly you have a cocaine problem, and it has to stop."

Quitting the Job

"I would never use cocaine," Nimo cried defensively. "I'm a good person. Everyone thinks so. You can ask my friends. I don't take drugs, and I never would!" She left in a huff.

The next morning, Nimo called in her resignation. "I quit starting now," Nimo's voice said on Lucy's voice mail. "I've given everything to this job including nights and weekends. You don't appreciate it, so I'm gone." She never returned.

Natalia is a HR Offcier at GDC



Benjamin Cheboi the Baringo County Governor, Grace Kiptui the Women Rep, Sen Gideaon Moi and area MP Asman Kamama flag off food consignment that GDC donated. Right, GDC staff Purity Gituma (L) interacts with a member of the community during the food drive.

A friend indeed

GDC in Baringo, Turkana

Thousands of residents from Turkana and Baringo counties recently received food, water, clothing and other items thanks to GDC's support.

The Company donated 2,150 bags of maize, 200 bags of beans, 40,000 litres of water and bales of clothes. The food drive was a joint effort between GDC staff and the company.

While flagging-off the consignment at Loruk Center, Dr Silas Simiyu, the GDC Managing Director, reaffirmed the company's commitment to irrigate farms in the area. He urged local leaders to ensure future generations do not starve.

"Irrigation is one of the many ways to solve food shortage in this region that often receives irregular rain. More than 57,000 hectares of land in Baringo County will be put under irrigation which will create more than 1.7 million jobs," he said.

The CEO added that the move will boost food security as it will lead to the establishment of a mega irrigation scheme which can reduce over-dependence on rain-fed agriculture and support the development of tourist resorts.

"This will in turn generate employment to 600,000 people in Baringo County and also the rest of the country," said Dr Simiyu.

The MD added that GDC will continue co-existing with the people in order to expedite development activities.

"We are here to co-exist with the people. Health, water, education and food security is our focus. We will buy an ambulance soon and ensure that people have water in Silali and other parts by pumping and piping water from Lake Baringo," he told locals.

The event was also attended by key leaders from the area led by Baringo Senator Hon. Gideon Moi, Baringo County Governor H.E Benjamin Cheboi, Tiaty MP Hon. Asman Kamama, Baringo Women Representative Hon. Grace Kiptui, Baringo Speaker Hon. William Kamket and Members of the Baringo County Assembly from East Pokot Sub-County.

The leaders also welcomed GDCs plan to generate power in the region.

"We call on our people not scare investors off from our resource-rich county," implored Hon. Gideon Moi, who is the Senator Baringo County and Chairman of the Senate Comittee on Energy, Inforamation and Communication.

GDC has started development work it the Baringo-Silali block and residnents will enjoy fresh water, access roads in the short term.

> Health, water, education and food security is our focus.

Benefactor... GDC MD and CEO Dr. Silas Simiyu doles out food rations to an elderly man in Loruk center, Baringo County

Nice Meeting you... Energy and Petroleum Cabinet Secretary Mr Davies Chirchir (Left) exchanging pleasantries with Mr. Johnson Mungania, Manager Infrastructure & Logistics at GDC while, KenGen's Geothermal Manager, Mr Geoffrey Muchemi looks on during the opening of the UNU training in Naivasha

Be our guest..students from Naivasha Girls High school take GDC MD and CEO Dr Silas Simiyu (in blue suit) through their science project at the GDC-Nakuru High Techical Career Fair

Ensuring all is well...A section of GDC staff peruse their papers before a presentation during the 2nd edition of the Annual GDC Symposium.

This is how it works...GDC Board Chairman Mr. Faisal Abbas (right) is taken through the geochemical analysis processes at the company's laboratories by Mr. John Lagat, Manager, Geothermal Resource Assessment

This is where the resource is located... Manager, Environment, Mr. Gabriel Wetangula (R), Chief Engineer Mr. Joseph Mberia (C) Senior Quality Assurance Engineer Mr. Nickson Osundwa peruse a map during a field work activity

Governor's race... The Governor of Nakuru County H.E Hon. Kinuthia Mbugua leads in the 2KM race at the 3rd Edition of the Menengai Geothermal Half-Marathon in Nakuru

A race with time: Participants in the last edition of the Menengai Geothermal Half-Marathon

We are the champs... GDC staff celebrate after winning a match at the annual company sports day

Title: *Who Moved my Cheese?*
Author: *Dr Spencer Johnson*
Reviewer: *Kiprotich Samoei*
Available at leading bookstores and supermarkets

Ever felt your life is stuck in a rut, or your energy is being sapped by a vicious rat race? Well, it happens to all of us. Atimes you don't know why you feel that way. Were you to look carefully, however, the problem could be that somebody moved your cheese.

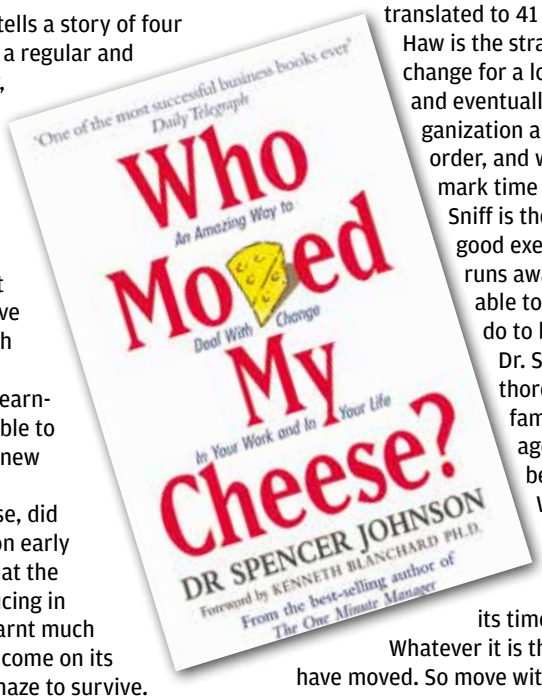
The cheese is our comfort zones, the things we are used to getting, almost entitled- a good job, a stable relationship, health or peace of mind. What happens when our comfort zones are disrupted? We will obviuosly react but not in the same way.

This book, Who Moved my Cheese, tells a story of four characters who lived in a maze with a regular and abundant supply of cheese. One day, however, the cheese was moved to another station. How the four reacted to the missing cheese is the basis of the story:

Sniff- a character who is a mouse, was able to sniff out the change early and tip his friend Scurry to put on their long un-used shoes and move ahead in the maze looking for a fresh source of cheese.

Scurry- a fellow mouse, who upon learning the cheese was dwindling, was able to scurry along the maze looking for a new cheese station.

Haw- a little man the size of a mouse, did not anticipate the change of situation early enough despite the clear warning that the cheese in Cheese Station C was reducing in quantity and quality. He however learnt much later after waiting for the cheese to come on its own that he had to move on in the maze to survive.



Starvation nudged him to move on. But before he could do so, he laughed at himself for missing all the tell-tale signs of impending trouble.

Hew- a believer in the old order and a fellow little man like Haw. He could not believe the cheese will never come back again and lay waiting for it in spite of the impassioned pleas by Haw. Even when Haw brought him the new cheese he found in the maze, he turned it down saying it didn't taste like the old cheese. Not even starvation could impel this guy to relinquish the status quo.

Both the storyline and the language are simple, it is a small book; anybody, even the poorest of readers, could devour in an hour, flat. Its simplicity and the almost Basic English level the story is told belies the depth of the message the book is conveying. The characters are full of symbolism, and whatever cheese you are chasing or missing, you will surely relate to either Sniff, Scurry, Haw or Hew. It could not have been translated to 41 languages for nothing.

Haw is the straggler in the company. He questions change for a long time, struggle to adapt to change and eventually catches up. The Hews in the organization are those who will hang on to the old order, and will either be made redundant or will mark time in the same position till retirement.

Sniff is the pro-active types while Scurry is the good executor who once he gets the vision, runs away with it. In the book, you will be able to know who you are and what you can do to be a better you.

Dr. Spencer Johnson wrote and co-authored the One Minute series of books, famous of which is the One Minute Manager that topped the New York Times bestseller chart. Published in 1999, Who Moved My Cheese was rated by Time magazine as one of the 25 most influential business books on management. It is a classic before its time.

Whatever it is that you want and can't find, it could have moved. So move with the cheese, and enjoy doing it!

Did you know ?

1. That the oldest archeological evidence of man's interest in geothermal phenomena is a painting of an erupting volcano that dates back to 7 B.C.?
2. That in 1852, the Geysers was developed into a spa called The Geysers Resort Hotel? And that the first guests included J. Pierpont Morgan, Ulysses S. Grant, Theodore Roosevelt, and Mark Twain?
3. That the Diamond Geyser in New Zealand has eruptions that can last from a few minutes to many hours, ejecting boiling water as high as 30 ft (9 metres) in the air?
4. That New Zealand's Ruatapu Cave, whose name means "Sacred Hole", extends 120 ft (37 metres) down into the earth? And that it has a thermal hot pool at its bottom called Waiwhakaata, meaning "pool of mirrors."?
5. That Ancient Romans made ice using thermal differentials – carving pits, putting in water and covering them during the day so they would freeze at night?
6. That the concept of the heat pump was first developed in 1852 by Peter Ritter von Rittinger, an Austrian engineer who discovered that it is far easier to move and upgrade heat utilizing the refrigeration process than to create heat?

Diamond Geyser, New Zealand
Picture: *Courtesy*

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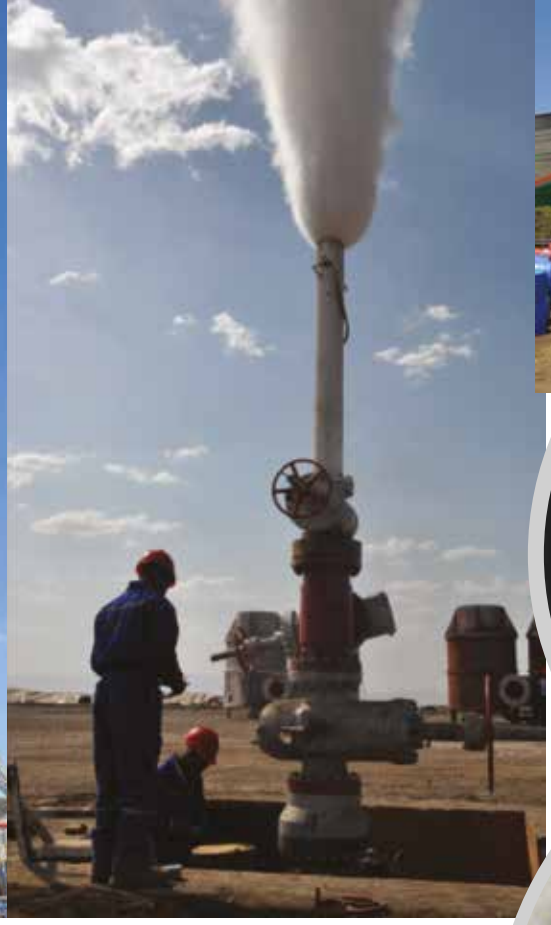
COUNTY GOVERNMENT OF NAKURU



5 years the rise of Menengai

Menengai was rugged, treacherous and shunned. It took the indomitable spirit of GDC to turn it into an admirable icon of power it is today