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A Publication of the Kenya Nuclear Electricity Board

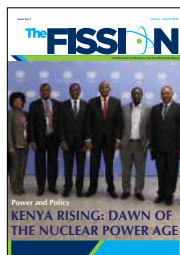


POLICYMAKERS IN NUCLEAR KENYAN LEGISLATORS VISIT TO RUSSIA AND CHINA

WINNER



KNEB's Director, Publicity and Advocacy, Mr. Basett Buyukah receives the award for Corporate Publication of the Year 2015 from Grace Munjuri, who is the immediate past Vice Chair of the Public Relations Society of Kenya.



Corporate Publication of the Year 2015

NUCLEAR EDUCATION

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POLICYMAKERS IN NUCLEAR

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TRAVEL TIPS

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TRAVEL TIPS



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CEO'S MESSAGE

Welcome to the 12th edition of the Fission Magazine, which covers the period from January to June 2018.

Stakeholder engagement, education and informing are the cornerstone for a successful nuclear power programme in any country. This is true as Kenya Nuclear Electricity Board (KNEB) has invested heavily on public sensitization through a number of activities and programs.

KNEB has a robust stakeholder engagement plan. This issue highlights some of the activities undertaken during this period by KNEB in stakeholder education and sensitization in Kwale, Mombasa and Kilifi Counties as well as the interactions with academia and industrial stakeholders.

KNEB's engagement with parliament through the Energy Committees in the National Assembly and The Senate are a key cog in the wheel of ensuring the success of the programme. Indeed the study visit by representatives from the bicameral Parliament to China and Russia give impetus to the entire push toward nuclear electricity generation in Kenya.

It is part of the process of building a strong national position where policy makers are sensitized on nuclear energy development in order to demystify the technology and boost their understanding of the subject. This in turn will boost the larger objective of enhancing the legal, regulatory and policy framework required for a nuclear power programme in Kenya.

ENG. COLLINS JUMA

CEO



Eng. Collins Juma
CEO

EDITORIAL

Welcome to the eleventh edition of the Fission Magazine. In this issue, as is custom we take a broad look at the news and events that have occurred as Kenya continues on the odyssey toward nuclear electricity generation.

In our cover story, we head true north to Russia and the idyllic Black sea city of Sochi where a Kenyan has been making waves as he comes out top in a competition during the World Festival of Youth and Students. We also get the back story of the international festival attended by five Kenyans, including three staff from the Kenya Nuclear Electricity Board, courtesy of the Memorandum of Understanding with the Russian State Nuclear Energy Corporation (ROSATOM). Then taking the flight back across the seas, we detour to the shores of West Africa and take a peek into Africa's nuclear power development based on experiences and observations in Ghana.

Back in Kenya, we focus on the Nairobi International Trade Fair and the dynamic exhibition display, which earned KNEB accolades. Then shifting gears to the gender agenda in energy, we stop by the Women in Energy conference and the interactions, plenary discussions, ideas, opinions and experiences.

Then we turn the spotlight on the Strategic Environment and Social Assessment of the nuclear power programme. We take you through the process, what it entails, as well as its importance in the nuclear field. We also touch base with the learned friends as they converge in Kwale County for their Annual Conference 2017.

Plus, there's an intern's testimony of her experiences on the job. Plus, we step up on the right royal greens for more than just a round of golf. In addition, we go up close and personal in the Interview section and give you some travel tips. Not forgetting the health and lifestyle segment.

Welcome. Enjoy the read.

BASETT BUYUKAH

EDITORIAL DIRECTOR



Basett Buyukah
Director Publicity & Advocacy

KENYAN LEGISLATORS RUN THE RULE ON NUCLEAR ENERGY DEVELOPMENT WITH VISIT TO RUSSIA AND CHINA



BY Basett Buyukah

Nuclear energy trends and developments worldwide were in focus in May 2018 as a high-powered delegation from Kenya's bicameral Parliament visited two of the world's leading nuclear power generating countries. Over a period of a fortnight, the legislators made stops in Russia and the People Republic of China.

This was part of a series of engagements and interactions with key stakeholders involved in policymaking towards the development of Kenya's nuclear power programme. The Kenya Nuclear Electricity Board (KNEB) coordinated the study visit for legislators drawn from the Energy Committees of the National Assembly and The Senate to Russia and The Peoples Republic of China.

KNEB has a memorandum of Understanding with the Russian State Agency for Nuclear Power (ROSATOM) and the China General Nuclear Power Corporation (CGN) for training, technical assistance in nuclear power development. The study visit took place between 11 May – 26 May 2018.

In sum, the study visit for the legislators had three broad objectives. Firstly, to enhance the understanding of the legislators on key aspects of nuclear power development, including world trends in the sector and overall appreciation of the various institutions or bodies required for a successful nuclear power programme. Secondly, to expose the legislators to nuclear power plants, which are in operation as well as associated facilities such as spent fuel storage. The third objective was to enable legislators appreciate the various uses of nuclear technology besides electricity production.

The Energy Committee of the National Assembly had a delegation of seven led by Hon. Joseph Manje. Others were Hon. Abdikhaim Osman, Hon. Elisha Odhiambo, Hon Richard Chonga Kiti, Hon. Faith Gitau and Hon. Walter Owino. Also in attendance was the Senior Committee Clerk, Benjamin Magut. From the Kenya Nuclear Electricity Board, CEO Eng. Collins Juma was accompanied by two Board Members: Ernest Orito and Joseph Odhiambo as well as Director, Publicity and Advocacy, Basett Buyukah.

During the Russian leg of the study visit, the delegation attended the ATOMEXPO 2018 in Sochi, Russia. This is a large gathering of the nuclear industry professionals held annually to showcase development in technology, benchmark on progress in nuclear power programmes and meet vendors and companies using nuclear technology for peaceful uses in fields such as health, water and agriculture.

The delegation also had an extensive workshop presentation by ROSATOM, which highlighted the Integrated Solution offered by the entity toward supporting a nuclear power programme such as Kenya's.

The Kenyan delegation was informed that ROSATOM would be willing to be involved in constructing a nuclear research reactor in Kenya. The benefits of a research reactor include training of personnel and production of medical isotopes, which would be useful in treating various illnesses without travel abroad.

The Kenyan delegation also observed water desalination solutions offered by various

entities. Desalination of salt water is key for cooling nuclear power plants. However, a large water desalination plant set up as part of the nuclear power complex would also afford water supply to the local communities.

In his presentation to the Kenyan delegation, Dr. Kelvin Kemm, Chairman of the South African Nuclear Energy Corporation (NECSA) emphasized that despite producing 44,000MW of electricity, South Africa was keen to have a further 9600MW from nuclear energy. It was also noted that Egypt, which currently has a generation capacity of 31,000MW has signed a deal with ROSATOM and the construction will commence in the near future.

The Kenyan Parliamentarians gave their views and perspectives on nuclear energy and the Kenya's intentions to utilize the technology for electricity generation.

"We have been educated on nuclear energy. The myths that we had that when you talk of nuclear you are talking of something that is explosive; something that can bring calamity has been removed from our minds. We have seen that nuclear is one of the safest sources of energy and it is available in large capacity and is reliable," Said Hon. Manje.



Left: Panelists at the global Partnership - joint success session

Facing Page: Kenyan Legislators from the Senate & Parliament, KNEB CEO, Board members & staff of CGN pose for a group photo after a tour of Daya Bay nuclear power Plant in Shenzhen, Guangdong Province.

“We need consistent supply of electricity that can turn Kenya into one of the powerhouses in manufacturing in East Africa. We are going to sell surplus power to the rest of the region. Kenya has always led East Africa. We must be at the epicenter of development,” said Hon. Elisha Odhiambo

“We as MPs will sit with our colleagues and convince them, convince even our President, that time has come for us to go nuclear,” said Hon. Faith Wairimu.

“All said and done, it is high time that nuclear energy be embraced,” said Hon. Chonga Kiti.

“After attending the ATOMEXPO Conference, I’m convinced Kenya needs to go to nuclear. If we need to generate employment opportunities we need to embrace it,” said Hon. Abdikhaim Osman.

The KNEB CEO, Eng. Collins Juma lauded the MPs for their keenness and perspectives while pointing out that Egypt is quite advanced with its preparatory stages for

nuclear power while Ghana, Nigeria, Morocco and Tunisia are proceeding apace.

“It is very clear in my mind that nuclear being the future technology is one of the takeaways from the conference. Indeed, the future of energy and baseload generation is in nuclear,” said Eng. Juma

The delegation then proceeded to the Peoples Republic of China. The Senate Energy Committee sent three Senators for this part of the study tour. They were Mary Seneta, Jones Mwaruma and Charles Malachy Imana.

During the China leg of the study visit, the delegation visited the Daya Bay nuclear power Plant in Shenzhen, Guandong Province. Its two units generate a total of 1984 MW of electricity. The visit included a visit to the skills training centre and waste disposal site. The delegation also visited Nuclear Power Virtual Simulation Lab and Safety Monitoring and Equipment lab. The delegation further visited the Dongfang

Electric Company’s equipment manufacturing site where various key components of a nuclear power plant are made.

In addition, the delegation visited the Yangjiang Nuclear Power Plant and witnessed firsthand a unit currently under construction.

The visit to Yangjiang Nuclear power plant site and related presentation demonstrated how Kenya could emulate China in achieving a high localization rate, in this case of 85% experienced in the new CPR 1000 NPP under construction at the site. Also, as all the 6 nuclear power plants were all constructed at the same site, the host Province has enjoyed relatively good economic prosperity as evidenced by its high GDP growth since the 1990’s, higher real estate prices, an annual rate of return on investment of more than 10% for completed nuclear plants, afforestation of about 70,000 hectares, provision of about 3,000 direct community jobs and development of a Tertiary Education Centre.

The delegation further held a bilateral meeting with top officials of the China General Nuclear Power Corporation.

Both the Russian State Agency for Nuclear Power (ROSATOM) in Russia and the China General Nuclear Power Corporation (CGN) emphasized the need for a strong and robust regulatory framework for nuclear power development in Kenya.

Left: The team after paying a courtesy call to the ambassador at the Kenyan consulate in Moscow.



KNEB ENGAGES KWALE, MOMBASA & KILIFI COUNTIES ON NUCLEAR ENERGY DEVELOPMENT IN KENYA



Governor for Kwale County - H.E. Salim Mvuria (3rd R) and Kenya Nuclear Electricity Board Management and Staff pose for a photo during a courtesy call at the Office of the Governor in Kwale County.

By Faith Kosgei

The Coastal counties of Mombasa, Kilifi and Kwale were the focus for KNEB's nuclear outreach activities in June 2018. The County Forums engagement's objective is to increase public awareness about nuclear energy and ultimately gaining public acceptance for the generation of nuclear electricity in Kenya. Further, they also seek to provide an opportunity to demystify nuclear electricity and provide factual, accurate information to the public.

In the period between 18th -29th June 2018, the engagement in Mombasa, Kilifi and Kwale Counties, took the form of interacts with the County Governments, Open days and industrial visits as well as career talks in schools to conduct and Corporate Social Responsibility (CSR) initiatives with students.

During the County Government interactions, discussions focused on the overview of the Nuclear Power Program and the current status, economic gains that would be realized, energy security, socio-economic development and improved infrastructure, should they host the nuclear power plant in their Counties. Demystification of nuclear power disasters, nuclear energy technologies, challenges and opportunities that come with putting up the plant such as establishment of a regulatory framework, were among the other issues highlighted.

Governor for Kwale County - H.E. Salim Mvuria (in grey) and Kenya Nuclear Electricity Board Management and Staff pose for a photo during a courtesy call at the Office of the Governor in Kwale County.

James Nguzo- County Executive Committee member for Energy, Mr. Mwachitu Kiringi- County Executive Committee member for Water, Forestry, Environment & Natural Resources and Solid Waste Management and Mr. Wilfred Baya- Chief Officer for Energy during the Kilifi County Government Visit.

Deputy Governor for Mombasa- Dr. William Kingi (center) and County Government of Mombasa Staff interact with KNEB Management at the Mombasa County Government office visit.

KNEB also conducted Open days at Ukunda Centre in Kwale, near Pwani University in Kilifi and at the Makadara grounds in Mombasa respectively. The Open Day aimed at educating and informing the public on nuclear electricity generation in Kenya, identifying public concerns and developing ways and means for the efficient and effective involvement of stakeholders in Kenya's nuclear energy development.

The Open Day attracted participants from the public and private sector, local residents, NGOs and wider stakeholders in the counties who had the opportunity to learn more about the country's nuclear program and hear about the latest developments.

From the engagement it was evident that raising awareness to members of the public is pivotal in developing community support, changing knowledge and attitudes about the misconceptions of nuclear energy.

Members of the public engage with KNEB Staff at their stand during the Open Day at Pwani University, Kilifi County.

National industrial participation is one of the major considerations when developing a nuclear power programme and KNEB has hit the ground running. Various goods and services are required to construct a nuclear power plant and to support its operation.

Due to high level of safety standards and requirements in order for industries to participate, there is need for them to comply with strict codes and standards and rigorous quality programmes associated with these goods and services. KNEB's objective is to increase national and local participation or to 'localize' those parts of industrial involvement that national industries can cost effectively achieve these high standards.

In this respect the KNEB delegation visited Base Titanium, Bamburi Cement and Kwale International Sugar Company Limited. During the visits, discussions focused further on the possibility of co-operation between the industries and KNEB in information exchange and enhancing public acceptance in Kwale, Kilifi and Mombasa Counties among others.

The KNEB delegation pose for a photo with Mohammed Mahsen of Bamburi Cement during the plant tour.

KNEB strives to be a socially responsible organization that strongly believes in sustainable development beneficial to communities in which it operates. As a Corporate Citizen receiving various benefits from society, KNEB's intent to make a positive difference to society in which the organization lives and operates.

KNEB conducted a number of CSR activities in Kwale, Kilifi and Mombasa County during the awareness campaign in the counties. The KNEB team visited Kombani Primary School in Kwale County, Mpirani Primary School in Kilifi County and Jomvu Primary and Secondary school in Mombasa County. KNEB offered the Students career

talks, distributed sanitary towels and undergarments as part of their CSR activities.

This deliberate move is necessary because it is the society that gives 'social license' to operate and their goodwill is necessary for continued security and room to operate long after the commissioning of a nuclear power plant is done.

KNEB's commitment to the positive transformation of people's lives has encouraged the stakeholders and staff to identify areas that need participation and attention thus accountable for effecting social change. Some of other CSR activities undertaken by KNEB in previous years include tree planting, building a drug rehabilitation Centre in Machakos County, sponsorship of charitable marathons and golf tournament among others.

KNEB Director for Publicity and Advocacy, Basett Buyukah speaks to students at Jomvu Primary School in Mombasa County during the Career talk session.

Kombani Primary School girls and their teachers pose for a photo with KNEB team during the Corporate Social Responsibility initiative at Kombani Primary School, Kwale County.

Throughout the awareness campaign in Kwale, Kilifi and Mombasa county information gaps and various concerns were identified. KNEB will continue to inform the public and other stakeholders on the benefits of nuclear power and clarify the doubts and risks associated with the use of nuclear electricity. This is part of wider stakeholder engagement, involvement and information campaign.



Kombani Primary School girls and their teachers pose for a photo with KNEB team during the Corporate Social Responsibility initiative at Kombani Primary School, Kwale County.

OPEN DAY AND COUNTY FORUM 2017/18 PICTORIAL



KNEB Board Members & staff members interact with county government officials, students, industrialists and members of the public during the 2017/18 county forum and open day which took place in the coastal counties of Kwale, Mombasa and Kilifi as part of the broader stakeholder engagement activity.

KNEB PITCHES NUCLEAR AT THE 5TH DEVOLUTION CONFERENCE



KNEB's Dennis Nkonge interacts with members of the public visiting our stand.

By Faith Kosgei

On 23 to 27th April 2018, Kenya Nuclear Electricity Board participated by way of exhibition and sponsorship of delegates to the 5th Annual Devolution Conference held at Kakamega High School, Kakamega County.

The four day Conference was organized by jointly by the Council of Governors (CoG), Ministry of Devolution and Arid and Semi-Arid State Department of Devolution (ASAL- MoDA), Senate and County Assemblies Forum (CAF).

Under the theme: Sustainability, productivity, effective and efficient governments for results delivery, the conference brought together different stakeholder groups from National and County Government, Senate and National Assembly, exhibitors, Private sector, youth, women among other from all the sectors of the economy to discuss the progress of devolution, bringing out the gains and the challenges of devolution and chart the best way forward.

This year's conference was a defining moment because it was an evaluation of devolution, five years into operationalization. The Conference adopted a sector approach in line with the President's Big Four agenda

with focus on Health; Urban Development, Housing, Infrastructure and Energy; Agriculture; and Trade & Manufacturing.

For each sector, the conference offered a platform for the National government, County Governments, citizens, the private sector, civil society and development partners to; access the status of the sector, determine the enablers for desired results, analyze human resource management issues and discuss opportunities for adequate financing.

At the opening of the conference – through a videolink from State House- President Uhuru Kenyatta announced the launch of the Kenya Devolution Support Programme and the Kenya Urban Support Programme, indicating that it will be performance-based conditional grants to the devolved units.

“Both combined, will inject Ksh 50 billion into your county governments, to help you build and improve the systems that support your staff, and your delivery of services,” he said. He further states that more than a trillion shillings have been transferred to the counties to bring essential government services closer to the people. And in those 5 years a legislative process has been established, firmly rooted in the county assemblies.

The president also recognized that Kenyans have made efforts from all spheres to spearhead the multilateral negotiations on trade, environments and Sustainable development. This was in recognition that the development of the country is not only an agenda concerning the government, but is the result of concerted efforts by all the stakeholders. One of the key issues he noted was the government was committed to ensuring that every Kenyan had access to adequate supplies of energy as one of the development agendas.

The conference was structured with sector breakaway meetings on Health, Urban Development, Housing, Infrastructure and Energy, Agriculture and Trade & Manufacturing in line with the



Delegates follow through the proceedings of the 2018 Devolution conference in Kakamega county.

President's Big Four Agenda.

The sector breakaway sessions were full with rich contributions from the members of the public, private Sector, National and County Government representatives. All the sessions were chaired by the Cabinet Secretaries or Principal Secretaries.

In attendance was the CS Ministry of Energy Charles Keter, CS Ministry of Devolution and ASALs Eugene Wamalwa, CS Ministry of Trade, Industries and Cooperatives Adan Mohamed, among other top government officials.

During the sector break out panel discussion on enablers to achieve affordable housing for all and universal access to energy, Cabinet Secretary for Energy, Hon. Charles Keter while addressing the delegates, mentioned that 'the Ministry of Energy as an enabler for the Big Four Agenda will partner with County Governments to drive universal access to electricity through projects that will improve access in both on-grid and Off-grid areas'.

Keter further said that the areas of support will include: the introduction of 50% discount on off-peak incremental consumption for large commercial and industrial customers to support manufacturing, completion of new transmission lines to support national irrigation schemes and incorporation of agro processing firms into the Time of Use Tariff regime to enhance food security, Prioritize grid availability and reliability in the Phase 1A of the Housing Plan, Provide discounted tariffs to local manufacturers of construction materials to the flagship Integrated Housing Development projects and Connection of all Level 4 hospitals to 3-phase power to improve stability and to power medical equipment.

The Devolution Conference was well attended and gave all the relevant stakeholders a platform to engage on important issues in relation to key sectors.

Kenya Nuclear Electricity Board (KNEB) staff were able to interact with Government officials, members of the public and private sector, national and county government, civil society, development partners and entrepreneurs from their exhibition booth to showcase nuclear energy. This served the organization's mandate to create awareness among the stakeholders on the subject. KNEB's Board Members, Chief Executive Officer and Director-Publicity & Advocacy were part of the team present.

KNEB recognize the role of county Governments and devolved units role in Kenya's nuclear power programme as it endeavors to engage county Government through various platforms including participation in the Devolution conference.

Energy CS Hon. Charles Keter was part of panelist that engaged the participants on what strides are being made to ensure power reaches all localities.



SIX KENYANS GRADUATE IN KOREA WITH MASTERS IN NUCLEAR ENGINEERING



By Diana Musyoka & Pauline Mulongo

Six Kenyans have graduated with Masters degrees in nuclear engineering from KEPCO International Nuclear Graduate School (KINGS). The commencement (graduation) ceremony for the class of 2018 was held on 17th January 2018, in Ulsan Korea.

The six Kenyans graduated with a Masters degree in Nuclear Power Plant Engineering and their overall academic performance was outstanding. Notable was Ms. Joyce Kemunto Mayaka, who gained the highest honor, and was awarded the Chairman's Award for Academic Achievement by KINGS President Oh Se Ke. Among the guests who witnessed the ceremony was Mr. Chege W. Gathoga, the representative of the Embassy of the Republic of Kenya in South Korea.

This was the third group of Kenyans graduating from Korea with a Masters degree under the Memorandum of Understanding between KNEB and Korea in assisting Kenya to build capacity for Kenya's nuclear power programme.

According to the International Atomic Energy Agency (IAEA) guidelines, Human Resource Development forms a critical pillar to the success of a nuclear power programme. Among the initiatives Kenya has adopted in training its manpower is the one for scientists and engineers on nuclear power plant technology at KEPCO International Nuclear Graduate School (KINGS) in South Korea.

KINGS is a specialized graduate school that trains students with both practical and theoretical knowledge on nuclear power plant technology. The school offers a Master of Engineering degree in Nuclear Power Plant Engineering on a 2-year program spread over six trimesters.

The program is tailored in such a manner that during the first year, students take theoretical and general courses on nuclear power plants. However, during the second year, they specialize in any of the following: Technology Expert Program, System Engineering Program, or Project Engineering Program. At the end of the final year, students are required to conduct and write on a personal project as well as defend it, in order to pass and qualify for award of Master degree. Upon completion of the courses and meeting the requirements for graduation, a commencement ceremony is organized for the award of the degree.

KNEB has facilitated the training of more than 20 Kenyan at KINGS.

2018 KINGS graduants from Kenya pose for a group photo





Joyce Mayaka



Maxwell Songa



Maxwell Songa



Pauline Mulongo



Francis Kevore



Diana Musyoka

KNEB SPONSORS THE KENYA SCIENCE AND ENGINEERING FAIR 2018



Students from Shree Cutchi Leva Patel Samaj School (Nairobi), winners in Physics Category pose for a photo with KNEB staff in this year's Kenya Science and Engineering Fair National Competition at Kibabii High school, Bungoma County.

By **Jonathan Njoroge & Emmanuel Wandera**

For Kenya to realize the goals and objectives of Vision 2030, Science and technology will inevitably play a major role. The 56th Kenya Science and Engineering Fair 2018 National competition thus had an appropriate theme: "Science and technology for actualization of vision 2030."

The four-day event was held at Kibabii High School, Bungoma County and brought together about 1,800 people who included: teachers, innovators, students, sponsors and officials from the Ministry of Education's State Department of Basic Education.

In its quest to nurture innovation and development in technology, Kenya Nuclear Electricity Board (KNEB) has been a major sponsor of Science and Engineering Fair. KNEB sponsored three categories out of the eleven contested. These were: Engineering, Physics and Energy. Winners received shopping vouchers, trophies and branded merchandise from KNEB.

Speaking during the closing ceremony The Deputy Director, Quality Assurance at the Teachers Service Commission, Mr. Mathenge, lauded the participants and challenged them to come up with even better innovations next time round.

'Innovation is beyond age, race, creed and time as such we need to keep dreaming, because science can change our future and the onus lies on young innovators like you,' said Mr. Mathenge.

KNEB took this opportunity to interact with young innovators, teachers and members of the public. This served the organizations mandate to create awareness among our stakeholder, to interact and answer some of their questions on matters of nuclear energy. This was the fifth year that KNEB was sponsoring the fair. The Kenya Science and Engineering Fair, previously known as the Science Congress, was launched in 1962 by members of the then Kenya Science Teachers Association.

The 2018 edition witnessed a wide array of submissions and projects, evidence of the effort and time the students had dedicated to their various innovations. Besides the entires from various parts of the country, there were two participants from South Africa, giving the contest an international flavour.

The students submitted their projects for judging by a panel selected by the Ministry of Education. The project categories include: Chemistry, Physics, Biology and Biotechnology, Mathematical Science, Food technology & Home Economics, Energy & Environmental Science, Applied Technology and Computer Science.

The awarding ceremony marked the climax of the fair and the winner of each category walked away with trophies and a shopping voucher worth twenty thousand Kenya Shillings, courtesy of KNEB.

Shree Cutchi Leva Patel Samaj School (SCLPS) from Nairobi West dominated as they won various accolades, even managing a 1-2-3 podium sweep in one of the categories. The winners will represent Kenya at the International level in South Africa and also get a chance to showcase their projects at the National Science, Technology and Innovation Week.

KNEB is committed in promoting science and innovation among the youth through sponsoring and partnering with initiatives such as the Kenya Science and Engineering Fair.



KNEB STAND AT THE SCIENCE FAIR

KNEB SPONSORS THE 2018 ENERGY MANAGEMENT AWARDS

By Esther Musyoka

In the spirit of promoting energy efficiency, Kenya Nuclear Electricity Board sponsored the 2018 Energy Management Awards (EMA) held on 12th to 13th April 2018 at the Safari Park Hotel, Nairobi.

Popularly known as 'EMA' is an annual event organized by the Kenya Association of Manufacturers (KAM) geared to promote excellence in energy management and recognizes small, medium and large enterprises that have achieved significant reduction in their energy consumption through implementation of efficient energy measures and technologies. This critical for Kenya as Kenya's commercial and industrial power consumers take up over 60% of the total generation which makes it essential to incentivize excellence in energy management.

The two-day event kicked off with CEO's Forum on Day One, a platform which delved into discussions with top industrialists, government and energy partners on the status and future of the energy sector in Kenya. The Forum's theme "Captive Energy Mix: The Future of Industrial Energy" was in tandem with the Ministry of Energy's plan to diversify power generation for universal access by all.

Speaking at the Forum, KAM CEO, Ms. Phyllis Wakiaga stated that the Association has been at the forefront of promoting a green economy through such initiatives as Waste management on Polyethylene Terephthalate (PET) plastic bottles, chemical wastes & Energy efficiency through initiatives such as energy audits. In the wake of the global debate on clean energy solutions, the energy sector will play a key role to spearhead Kenya's agenda to fulfil its commitment for Green House gas emission targets.

Day Two culminated to a vibrant Gala and Awards ceremony to mark and celebrate major milestones



Phyllis Wakiaga, Chief Executive Officer of the Kenya Association of Manufacturer

achieved in respect of energy efficiency in Kenya, particularly by the manufacturing industry. The theme of the Awards dubbed “Setting the Pace in Resource Efficiency Towards Competitive Local Manufacturing” recognized with jubilation over 20 local manufacturing companies for incorporating energy efficiency practices in their processes.

‘Kenya is one of the countries which have shown leadership in embracing renewable energy and dedicating substantial resources to tapping sustainable energy solutions,’ said Flora Mutahi, KAM Chairperson.

‘EMA has been a signature event on the KAM’s calendar since its inception in 2004. Our main objective has been to promote, recognize and drive energy efficiency and conservation,’ she added.

The Chief Guest during the event was the Chief Administrative Secretary, Energy & Principal Secretary of Renewable Energy, Prof. Colleta Suda who conveyed the government’s commitment to provide universal access to energy as a means to spur economic development while noting that energy is a critical enabler in powering the manufacturing pillar of the Big Four Agenda as it is envisaged to improve the reliability and stability of power in Kenya.

‘The Government is dedicated to provide affordable, reliable and sustainable power. In support of this drive, government agencies in the energy sector privy to their respective roles have embarked on various projects geared towards achieving this agenda,’ said Prof. Suda.

The Principal Secretary of Energy, Dr. Eng. Joseph Njoroge was also in attendance, flanked by various CEOs from the energy sector

Bidco Africa Limited was crowned the overall Energy Management Award winner, dethroning the previous year’s winner, Chandaria Industries Limited. Other companies in the manufacturing sector were also recognized for their focus in the energy efficiency agenda.

Kenya Nuclear Electricity Board (KNEB) was among the sponsors of the EMA Accompanying the KNEB CEO, Eng. Collins Juma were Board members, Management and Staff. This is the fourth time KNEB was participating in EMA which offers a strategic platform to engage and sensitize a key stakeholder segment- manufacturers- on Kenya’s plan to introduce nuclear power in its energy mix as envisioned by the government to provide a sustainable solution to energy sufficiency.

KNEB has an elaborate stakeholder engagement and sensitization programme to cover all its stakeholders using different avenues.



THE CASE FOR NUCLEAR ELECTRICITY- THE KNEB PERSPECTIVE



Dr. Josephine Sinyo, Board Member- Kenya Nuclear Electricity Board delivers her remarks during The Women in Energy Conference 2017 held at Strathmore University

By Kelvin Mabonga, Brands & Beyond Ltd

Nuclear electricity is reliable, affordable, dependable, sustainable and clean' this was the message by Dr. Josephine Sinyo, KNEB Board Member as she made the case for nuclear electricity on behalf of the Kenya Nuclear Electricity Board (KNEB) at the 2017 Women in Energy Awards and Conference at Strathmore Business School. As a promoter of nuclear electricity in Kenya, KNEB advocates for the construction of nuclear power plants in Kenya for electricity generation of up to 4000MW.

Nuclear electricity began as a government project in 2010 and is envisioned in Vision 2030, Medium Term Plans II and III as a means to attain 4,000 MW of power in the grid. KNEB believes contributions by nuclear electricity will allow for sufficient electricity for the manufacturing industry and general use.

The Government plans to enlarge the grid such that every household, every, industry and infrastructure in the country has reliable electricity. KNEB is confident that contributions from nuclear electricity will bring

these plans to fruition thus improving the standard of living and allowing women access to low-priced Kenya-produced energy for household use including food preparation and refrigeration.

KNEB asserts nuclear electricity is one way to mitigate energy security risk with respect to availability. As recently as 2013, Kenya had blackouts lasting 3 to 6 hours putting the entire country in a dilemma. The Government saw the need for nuclear electricity citing its consistency, given that prolonged blackouts can be exploited.

In Kenya, electricity is expensive because we import it from our neighbor Uganda at a high cost. KNEB considers solar power and hydroelectricity to be unreliable. Hydroelectricity is subject to the environment and nature. Occasionally, there is hydro power rationing due to low water levels or other challenges with dams.

Currently, Kenya has neither nuclear power plant operator, regulator nor a law pertaining to operating a nuclear power plant. It is anticipated that the Energy Bill will legislate nuclear electricity. KNEB expects the Energy Bill to name Radiation Protection Board, which currently supervises radiation matters from hospital and agricultural use, as the nuclear electricity regulator with KNEB as the stand-alone institution promoting nuclear electricity. KNEB will ratify international treaties covering nuclear safety, nuclear security and civil liability, rather than use of traditional regulations.

Nuclear electricity is a regime that is very closely monitored. The fear of terrorism with respect to nuclear power plants is covered in international treaties and conventions for small nuclear gadgets as well as large scale facilities, which Kenya will domesticate and apply.

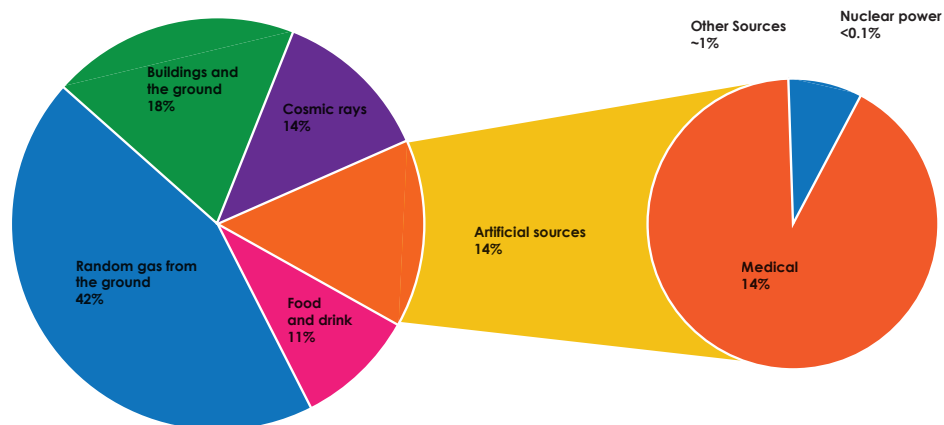
Given the nature of a nuclear plant, there are specific areas in the country where a nuclear power plant can be situated which is dependent on mandatory feasibility studies, which are currently underway.

A nuclear power plant under construction in China



RADIATION SOURCES AND FACTS

Sources of background radiation



alpha: fast-moving helium nucleus, stopped by air, skin or paper



beta: high energy electron, stopped by aluminium plate or glass



gamma: high energy photons, stopped by, dense material, such as concrete or water

Protection from radiation

Time: Dose is reduced by limiting exposure time.

Distance: The intensity of radiation decreases with distance from its source.

Shielding: Barriers of lead, concrete or water give good protection from penetrating radiation such as gamma rays.

Containment: Radioactive materials are confined to keep them isolated from the environment.

The international commission for radiological protection (ICRP) has developed a system for protection with three basic principles:

Justification: No practice involving exposure to radiation should be adopted unless it produces a net benefit to those exposed or to society generally.

Optimization: Radiation doses and risks should be kept "as low as reasonably achievable" (ALARA), economic and social factors being taken into account.

Limitation: The exposure of individual should be subject to dose or risk limits, above which the radiation risk would be deemed unacceptable.

What is radiation?

Radiation is energy being transmitted through space. Visible light, ultra-violet light transmission signals from TV and radio communications are all forms of radiation that are common in our daily lives. These are all referred to as 'non-ionizing' radiation.

Radiation particularly associated with nuclear medicine and the use of nuclear energy, along with X-rays, is 'ionizing' radiation.

Key points

- Radiation is **easy to detect**, even at extremely low levels.
- Radiation **exists naturally** everywhere at widely varying levels. Places exist where people live with 100 times higher than average background from the ground. A few areas even have levels 1000 times the average.
- Mankind has evolved in a world with strongly differing background radiation without developing a sense to detect it.
- Radiation has always been around and is now **well understood**. It has been used and studied for more than 100 years.

NUCLEAR CAREERS SHOWCASED AT UON



UNIVERSITY OF NAIROBI

8th Open Day

THEME:

'Topping into opportunities for knowledge, skills and values'



Dates: February 1-3, 2018

Venue: Great Court, Main Campus

Time: 8.00am to 5.00pm

By Irene Njoroge

Kenya Nuclear Electricity Board (KNEB), in collaboration with the Institute of Nuclear Science and Technology (INST), participated in the University of Nairobi's Open Day, held on Thursday 1st Feb through Saturday 3rd February 2018 at the main campus along University Way, Nairobi.







Different faculties of the university showcased their various academic and training programmes in a successful event that saw hundreds of high school students converge at the institution to learn more about the courses they wished to study after completing their secondary education.

The exhibition formed part of KNEB's nuclear career programme for high schools and tertiary institutions that encourages students in career selection and interests them in nuclear related careers by linking industry and academia.

The three-day event, organised under the theme: "Quality and Innovative Education to Sustain Industrial Growth," provided students with an opportunity to enquire about the courses on offer at the university.

KNEB's stand at the Open Day attracted many students who were curious to learn about nuclear technology. This was the third occasion for KNEB to participate in the UoN Open Day exhibition.

INTERESTING FACTS ABOUT NUCLEAR REACTORS

 <p>1x = OR</p>	<p>Just one uranium fuel pellet - roughly the size of the tip of an adult's little finger - contains the same amount of energy as 17,000 cubic feet of natural gas, 1,780 pounds of coal or 149 gallons of oil</p>		<p>Nuclear energy is being used in more than 30 countries around the world, and even powers Mars rovers</p>
	<p>A typical nuclear plant can generate enough electricity to power 690,000 houses without creating air emissions</p>		<p>13 percent of the world's electricity comes from nuclear power plants that emit little to no greenhouse gases</p>
	<p>A typical nuclear reactor works 24/7 at a 90% average capacity factor</p>		<p>A typical nuclear reactor on an average refuels 1/3rd of fuel every 18th month</p>

THE LARGEST PRODUCERS OF NUCLEAR POWER ARE THE US, FRANCE AND JAPAN.



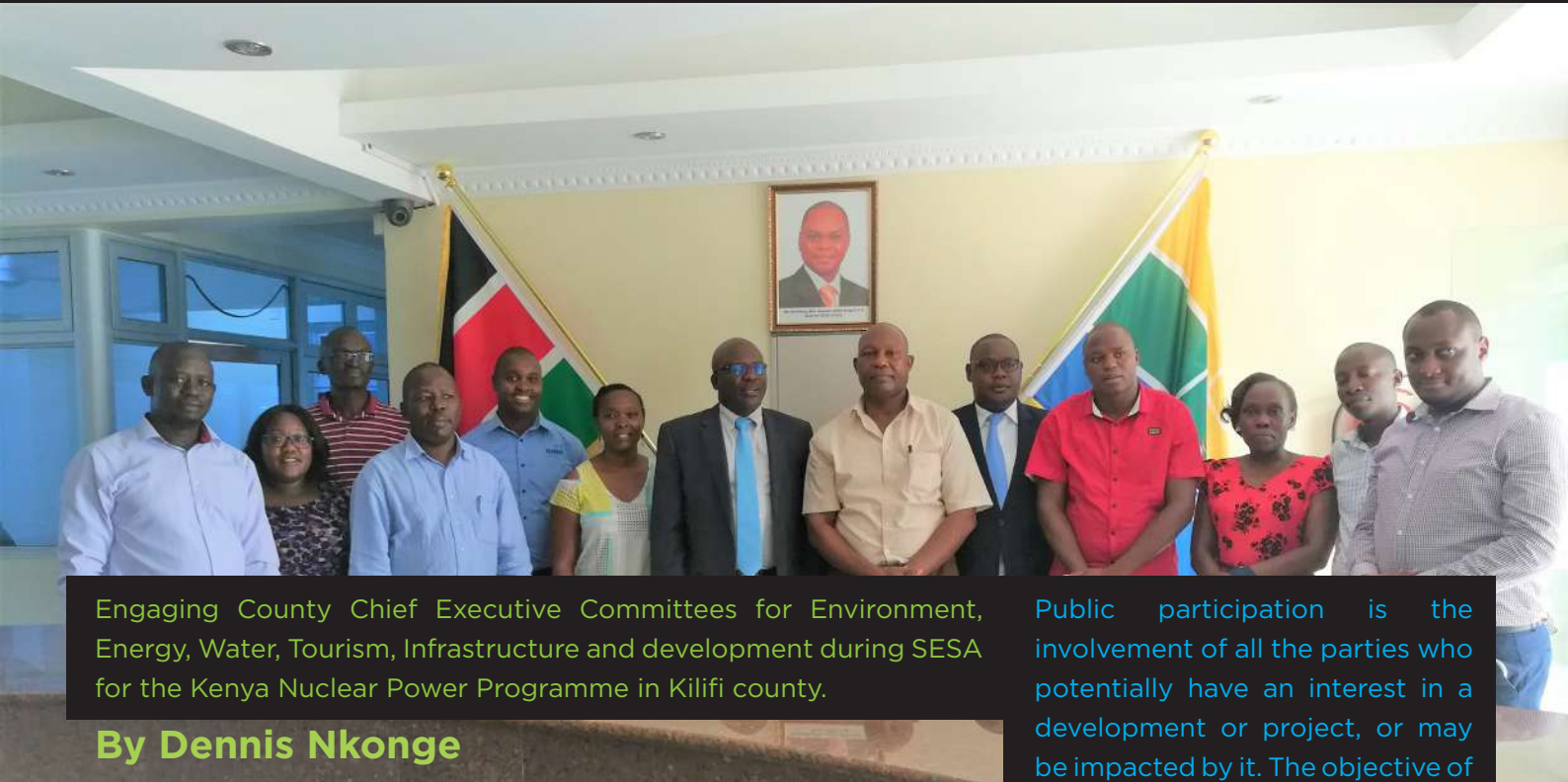
Crossword Puzzle Answers

<p>1. Radiation 3. Kinetic 5. Energy 6. Gamma 7. Thorium 9. Fission 11. Electrons 12. Austria 14. Uranium 16. Beta</p>	<p>2. Alpha 4. Atom 8. Irradiate 10. Cancer 13. Isotope 15. Absorber 17. Power 18. Ion 20. Nucleus 21. Atomic mass</p>
Down	Across
19. Dose	

Country Nuclear Profile in Africa

	Country	Status
1.	Egypt	Site preparation for first four NPP with a total of 4800 MWe is underway.
2.	South Africa	Two reactors currently in operation at Koeberg with total installed capacity of 1,800MWe
3.	Nigeria	30kW research reactor in operation. Nigeria Nuclear Regulatory Authority (NNRA) was set up for regulatory oversight on all uses of ionizing radiation. Nigeria Atomic Energy Commission (NAEC) announced selection of four sites for further evaluation. Signed a cooperation agreement with Russia including provision for uranium exploration and mining in the country.
4.	Ghana	30kW research reactor in operation. Nuclear Regulatory Power Act to establish an independent regulator – Ghana Nuclear Regulatory Authority (NRA) - was passed by Parliament in 2015.
5.	Kenya	Plans to realize NPP by 2027. Agreements of assistance in Nuclear Power Development with Russia, China and Korea have been signed. Nuclear energy policy to set up the national nuclear regulator is pending presidential ascent. Site selection is underway.
6.	Uganda	Government signed an agreement with IAEA to initiate the provision of a framework to develop nuclear power generation.
7.	Tanzania	Government has expressed an intention to investigate the use of nuclear power
8.	Zambia	Agreement between Rosatom and Ministry of Education for the construction of the center for Nuclear Science and technology in Zambia, with a 10 MWe research reactor.
9.	Namibia	The government has committed to a policy position of supplying its own electricity from nuclear power given that the country holds about 7% of the world's uranium reserves.
10.	Tunisia	Evaluation of possible construction of a 600 - 1000 MWe NPP by the government is underway.
11.	Libya	10MW research reactor present. Development of Institutional infrastructure for setting up a NPP currently underway. A site for both power generation and desalination has been selected.
12.	Algeria	Two research reactors currently operating. Signed agreements with Rosatom and China for design, construction and operation of NPPs and nuclear research respectively.
13.	Morocco	2MW Triga research reactor under construction. Pre-project study for desalination is complete. Government has approved setting up of a Nuclear Safety Agency
14.	Sudan	Government set up the Nuclear Energy Generation Department. Plans to have an NPP with four 300-600 MWe or 4400 MWe operating by 2030

KNEB CONDUCTS PUBLIC PARTICIPATION ON STRATEGIC ENVIRONMENTAL AND SOCIAL ASSESSMENT



Engaging County Chief Executive Committees for Environment, Energy, Water, Tourism, Infrastructure and development during SESA for the Kenya Nuclear Power Programme in Kilifi county.

By Dennis Nkonge

Public participation is both a key promise and provision of the constitution of Kenya. Commencing in February 2018, the Kenya Nuclear Electricity Board embarked on a public participation exercise across the counties of Kenya. This is in compliance to Kenya's constitution that stipulates public participation to be instilled in the national values and principles as per Article 10 of Kenya's constitution.

A team from KNEB hit the ground in conducting public participation in the counties in respect of the strategic environmental and social assessment for the proposed nuclear power programme in Kenya.

KNEB works closely with the Council of Governors secretariat in informing the interested and affected parties, including but not limited to County Executives member(s) and county assembly committees for Environment, Planning, Energy and Water. Focus group meetings are organized at the county offices and a comprehensive report based on submissions made by the participants is prepared.

So far KNEB has conducted public participation in 21 counties: Kwale, Mombasa, Kilifi, Turkana, Nandi, Uasin Gishu, Bomet, Kericho, Nakuru, Kisumu, Siaya, Busia, Homa Bay and Migori, Muranga, Nyeri, Kirinyaga, Embu, Meru, Garissa and Kitui, out of the 47 counties in the country.

Public participation is the involvement of all the parties who potentially have an interest in a development or project, or may be impacted by it. The objective of conducting public participation is to meet all the legal requirements, to ensure that interested parties are informed of the proposed nuclear power program.



Below: Nuclear Law explained by KNEB's Katua Muinde

KENYATTA NATIONAL HOSPITAL RECEIVES ADVANCED EQUIPMENT



KNEB CEO Eng. Collins Juma (Second left) handing over the Breast Board for cancer screening to Kenyatta National Hospital CEO Ms. Lily Koros (third from right) flanked with officials from KNEB and KNH at Kenyatta National Hospital

By Emmanuel Wandera & Jonathan Njoroge

On 27th February 2018, Kenya Nuclear Electricity Board (KNEB) officially presented the Kenyatta National Hospital with equipment to assist in breast cancer therapy.

The Breast Board, which had been donated by the International Atomic Energy Agency was handed over to the referral hospital's CEO, Lilly Koros by KNEB CEO Eng. Collins Juma.

'We are committed to help Kenyans suffering from cancer by provision of equipment and training opportunities to health facilities in the country through our various partnerships,' said Eng. Juma who also serves as the National Liaison Officer for the International Atomic Energy Agency.

The breast board is used in patient positioning and immobilization for treatment of the thorax, abdomen and breast range from simple positioning devices to mechanical, raised arm systems all designed to improve accuracy, reproducibility and patient comfort.

'Breast cancer is the number one prevalent cancer in Kenya and the donated breast board will go a long way in helping in diagnosing and treatment of patients in Kenyatta National Hospital (KNH),' said Dr. Anthony Nderitu, Director Corporate Service at the hospital.

Cancer is one of the leading causes of deaths in Kenya and still the most expensive to diagnose and treat in the bid to offer support KNEB showed its commitment to assist in the fight against cancer through the donation. This is a single step of many required to make cancer treatment affordable, accessible and more reliable in Kenya to help diagnose early and treat the killer disease.

Cancer related deaths are in the region of 27,000 per year. Most cases of cancer are diagnosed at a late stage due to insufficient cancer facilities, lack of awareness and high cost of diagnosis.

February 4th is the World Cancer Day, when organizations and individuals around the world unite to raise awareness about cancer and work to make it a global health priority.

Nuclear power & reactors worldwide

Location	Nuclear electricity generation, 2016 (billion kWh)	Share of total electricity production, 2016 (%)	Number of operable reactors*	Nuclear generating capacity* (MWe)
Argentina	7.7	5.6	3	1627
Armenia	2.2	31.4	1	376
Belgium	41.3	51.7	7	5943
Brazil	15.9	2.9	2	1896
Bulgaria	15.8	35.0	2	1926
Canada	97.4	15.6	19	13,553
China	210.5	3.6	36	32,637
Czech Rep	22.7	29.4	6	3904
Finland	22.3	33.7	4	2764
France	384.0	72.3	58	63,130
Germany	80.1	13.1	8	10,728
Hungary	15.2	51.3	4	1889
India	35.0	3.4	22	6219
Iran	5.9	2.1	1	915
Japan	17.5	2.2	42	39,952
Mexico	10.3	6.2	2	1600
Netherlands	3.8	3.4	1	485
Pakistan	5.1	4.4	4	1040
Romania	10.4	17.1	2	1310
Russia	179.7	17.1	35	26,865
Slovakia	13.7	54.1	4	1816
Slovenia	5.4	35.2	1	696
South Africa	15.2	6.6	2	1830
South Korea	154.2	30.3	25	23,081
Spain	56.1	21.4	7	7121
Sweden	60.6	40.0	9	8849
Switzerland	20.3	34.4	5	3333
Ukraine	81.0	52.3	15	13,107
UK	65.1	20.4	15	8883
USA	805.3	19.7	99	99,678
Total**	2490	11.5	447	392,080

*as of 01.05.2017

Sources:KNEB, WNA, IAEA

**The world total includes six reactors on Taiwan with a combined capacity of 4927 MWe, which generated a total of 35.1 billion kWh in 2016, accounting for 16.3% of its electricity generation.

AFRICA'S NUCLEAR FACTS AND FIGURES

South Africa is the only African country with fully functioning nuclear reactors, it is also the only independent state in the world to voluntarily end its own nuclear weapons programme, disassembling its weapons in the early 1990's.

South Africa plans to build eight new nuclear power plants totaling up to 9,600 megawatts by 2030 as part of their estimated \$37 billion nuclear expansion program.

According to the World Nuclear Association, countries actively considering nuclear power programs include Nigeria, Ghana, Senegal, Namibia, Sudan, Uganda and Namibia, while countries already developing plans include Nigeria and Kenya.

The Africa Energy Outlook notes that sub-Saharan Africa "includes three of the ten-largest uranium resource-holders in the world," which include Namibia and Niger.

Namibia holds about 8.2 percent of the world's uranium reserves mined from two sites to fuel nuclear power stations around the world.

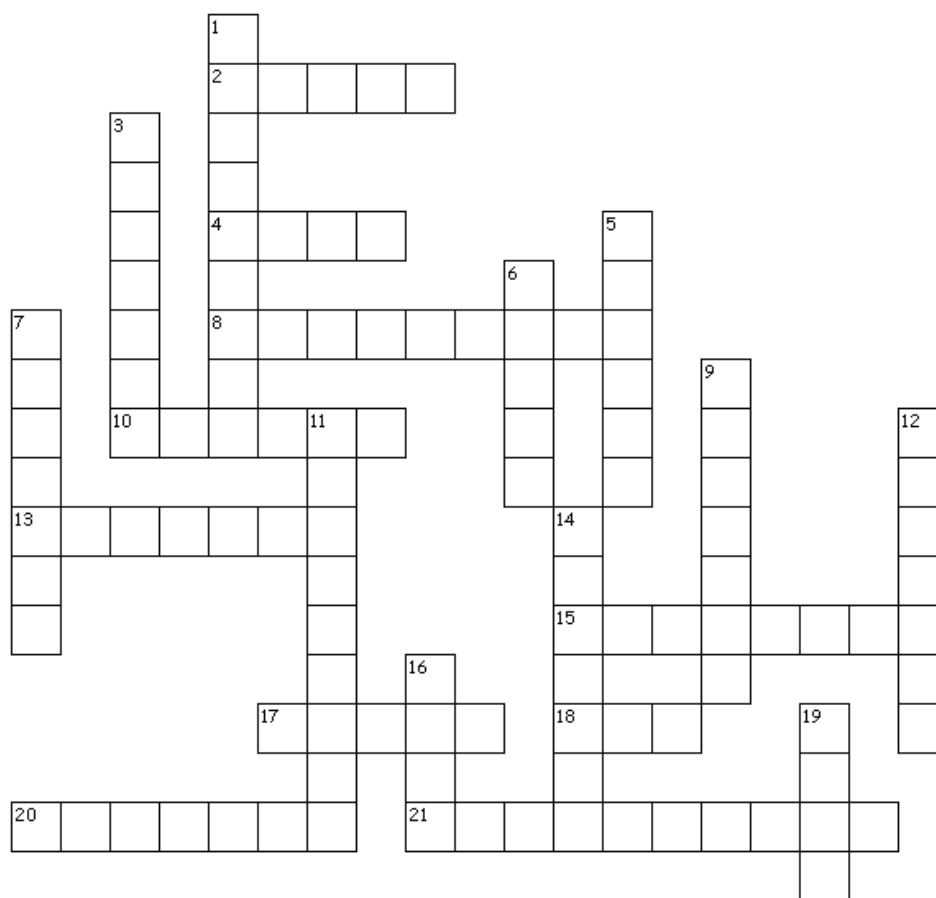
Niger also has two uranium mines which supplies about 7.7 percent of the world's uranium.

Koeberg Nuclear Power Station, Capetown, South Africa



Nuclear Science & Technology

CROSSWORD PUZZLE

**Across**

- 2.** is the least penetrating radiation and can be stopped (or absorbed) by a sheet of paper.
4. Basic unit of a chemical element
8. To expose to some form of radiation
10. Too much ionization of body tissues may cause
13. Element that contain equal numbers of protons but different numbers of neutrons in their nuclei
15. A material that stops ionizing radiation
17. Rate at which energy is transformed?
18. An atomic particle that is electrically charged, either negative or positive
20. Core of an atom
21. Total no of protons and neutrons

Down

- 1.** Transfer of heat through space
3. Energy at motion
5. Ability to do work
6. Electromagnetic radiation of the shortest wavelength and highest energy
7. Chemical element with symbol Th
9. Splitting of a heavy nucleus into two roughly equal parts
11. Negatively charged particles of atom
12. Headquarters of International Atomic Energy Agency
14. Fuel most widely used to produce nuclear energy
16. Radiation that can be stopped by a thin sheet of aluminum.
19. Term denoting the quantity of radiation or energy absorbed in a specific mass

[Answers on Page 25](#)

ARGENTINE AMBASSADOR PAYS KNEB A COURTESY CALL



Argentine ambassador Mr. Martin Gomez Bustillo when he paid a courtesy call to KNEB CEO Eng collins Juma at KAWI house office.

By Carl Madara

On 7th March 2018, H.E. Martin Gomez Bustillo, Argentina's Ambassador to Kenya paid a courtesy call at the Kenya Nuclear Electricity Board's offices at Kawi Complex, South C.

He was received by top officials from KNEB led by CEO Eng. Collins Juma. The Ambassador was keen to learn more about Kenya's nuclear power programme and potential areas of cooperation with Argentina in the sector.

Argentina has three nuclear reactors generating about five percent (1632MW) of its electricity with its first commercial nuclear power reactor began operating in 1974. Argentina is planning to build two additional nuclear power plants to boost their energy mix.

During the meeting Ambassador Bustillo extended an invitation to KNEB and Kenya to visit their Balseiro Institute - an academic institution chartered by the National University of Cuyo and the National Atomic Energy Commission. It is located in Bariloche, Río Negro province, Argentina- and INVAP- the company that specializes in the design and construction of nuclear research reactors, radioisotope production plants, nuclear fuel manufacturing plants, uranium enrichment facilities, neutron beam transport systems, radiation protection instrumentation, reactor protection systems, and modernization and refurbishment of research reactors- to increase Kenya's understanding and knowledge on nuclear issues and the ways in which collaboration can be undertaken with Argentina.

FUNDING AND FINANCING OF NUCLEAR POWER PLANTS



For any project one engages in, before we start we always ask ourselves ‘why do it’, this is the same for nuclear power project. As a country before Kenya embarked on nuclear electricity generation project, we asked and answered this question on why Kenya needs nuclear electricity. Here are some of the answers to that question;

- a) For the Vision 2030 projects and programmes to be realized, the energy requirement will rise to over 16,000 MW. This demand will need to be met by a variety of energy sources including nuclear power.
- b) Nuclear energy is a critical technology for addressing climate change.
- c) Nuclear energy is competitive relative to other electricity sources and offers protection from the volatility of fossil fuel and CO2 prices.
- d) Nuclear energy offers supply security: uranium resources are well distributed around the world and nuclear fuel is easily stored.
- e) Nuclear energy offers remarkable operational performance and safety, largely due to a new generation of reactors (referred to as Generation 3 plus).

The cost and the approaches to get it

Cost estimates for new nuclear plant construction is between 300 and 600 billion Kenyan shillings for a 1,000 MW plant. These costs are very much dependent on the technology chosen (different vendors have varying costs), location of the plant (due to unique siting requirements) and mode of financing.

The total cost components of a nuclear power plant comprises:

- I. **Capital Cost** (Owners cost, inflation cost, Bare plant cost).
- II. **Financing Cost**, these are the costs of total expenses associated with obtaining loan capital
- III. **Overnight Capital Costs**, consist of Engineering Procurement Costs(EPC)
- IV. **Operation and Maintenance Costs(O&M)**,are costs of operating a nuclear power plant plus fuel
- V. **Other costs** include Capital escalation and Interest during construction costs.

Ways of getting the money for construction of nuclear power projects

a) **Vendor equity** – Reactor technology vendors may be able to support new build projects financially as well as technologically. This realization gave rise to vendor equity, which helps to finance a project in return for the vendor’s technology being deployed in the new facility.

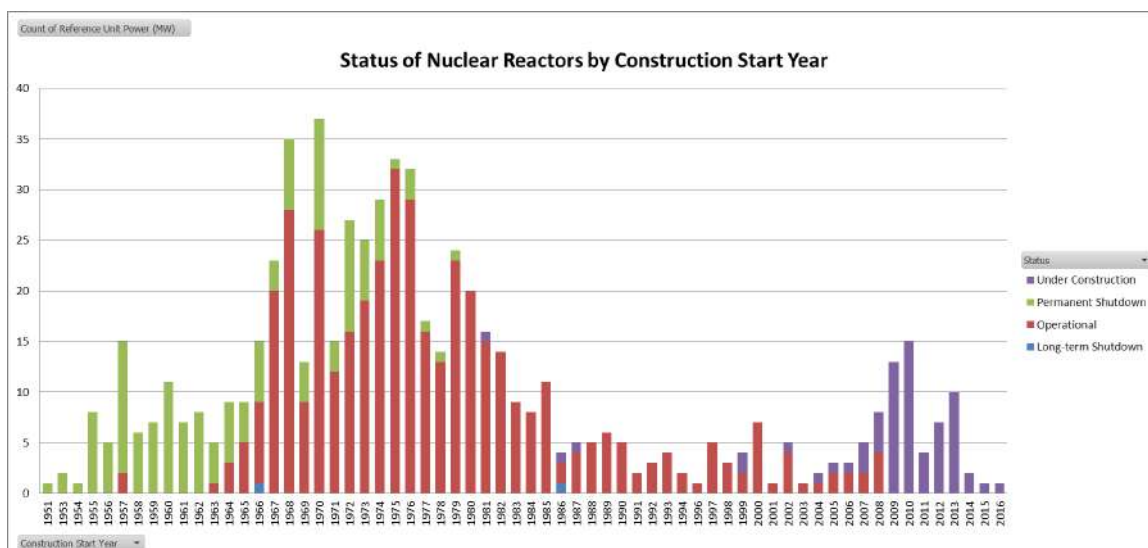
b) **Equity financing model** – In equity financing, an investor provides funding in exchange for an ownership share in the project. The investor will receive returns from the sale of electricity once the plant is in operation.

c) **Debt financing model** – Here a bank or other lender makes a loan for some proportion of the expected cost of the project to the project’s sponsors, against which some security or collateral is provided (normally collateral for the loan is the project itself). The loan is to be repaid, with interest, in accordance with the loan agreement.

d) **Government financing** – Direct Government involvement in the nuclear power project may take any of several forms: asset ownership, equity participation, risk sharing and provision of various incentives including loan guarantees.

e) **Project financing** – Project financing could be used in financing the nuclear power project through establishment of a separate corporate entity to own the power project, with shares in this company being bought by participants in the project.

In conclusion it is important to note that all the cost components of any energy project are the same, what varies is the individual figures of different generating technologies.



THE EXPERIENCES AND REFLECTIONS OF AN INTERN

By Judith Maina

A journey of a thousand miles begins with one step, it is such a cliché saying but that is how every big success story begins and that is how mine has begun. I have always been drawn to work for people; solve people's issues. My career started off in the hospitality industry but during my career path I decided to venture into human resource.

Human Resource for me is all about being a leader, an example to employees in the organization, a representation of the people/employee that the organization has. Human Resource at Kenya Nuclear Electricity Board (KNEB) opened a new perspective about the role of human resource personnel. You can say we are like the 'house managers' of an organization ensuring all things/people are in order and in their respective places/departments.

The best way to learn is by doing. I have gained a lot of experience during my internship at KNEB which was contrary to my initial thoughts. The first few weeks of my internship was a warm up of what was to come. Never in my life, have I been so occupied and engaged as I have been during my internship. I have gotten accustomed to have a long to-do list for the day which at times spills over to the next few days. This is not a complaint but, more of a gratitude because such work has taught to be more responsible, a quality of a good human resource professional.

In conclusion, interning at KNEB has exposed and equipped me with hands-on experience of the human resource profession critical to my career path. I have learnt to think of solutions on the spot, be pro-active and work in an environment where people hold different opinions and eventually come to a common ground understanding. It is not everyday you get to work in a nuclear energy organization and have friends asking you: "You mean there is nuclear energy being harnessed in Kenya?".

You feel like you are a part of the geek league or perhaps as smart as Albert Einstein to be part of a scientific organization. Thank you for the opportunity.



KNEB has an internship programme where continuing students or fresh graduates are attached in the organization for a period of three months across all the departments where they get first experience of working a nuclear electricity organization.

THE IMPORTANCE OF TRAINING EMPLOYEES



By Hillary Kipchirchir

Training presents a prime opportunity to expand the knowledge base and skills of employees. Training and development provides both the company as a whole and the individual employees with benefits that make the cost and time a worthwhile investment.

Addressing Weaknesses

Most employees have some limitations in their workplace skills. A training program allows you to strengthen those skills that each employee needs to improve. A development program brings all employees to a higher level so they all have similar skills and knowledge. This helps reduce any weak links within the company who rely heavily on others to complete basic work tasks. Providing the necessary training creates an overall knowledgeable staff with employees who can take over for one another as needed, work on teams or work independently without constant help and supervision from others.

Improved Employee Performance

Employees who receive the necessary training are better able to perform their job. They become more aware of safety practices and proper procedures for basic tasks. The training also builds the employee's confidence because they have a stronger understanding of the industry and the responsibilities of their job. This confidence will push the employees to perform even better and think of new ideas that help them excel. Continuous training also keeps the employees on the cutting edge of industry developments. Employees who are competent and on top of changing industry standards help the company hold a position as a leader and strong competitor within the industry.

Consistency

A structured training and development program ensures that employees have a consistent experience and background knowledge. The consistency is particularly relevant for the company's basic policies and

procedures. All employees need to be aware of the expectations and procedures within the company. This includes safety, discrimination and administrative tasks. Putting all employees through regular training in these areas ensures that all staff members at least have exposure to the information.

Employee Satisfaction

Employees with access to training and development programs have the advantage over employees in other companies who are left to seek out training opportunities on their own. The investment in training that a company makes shows the employees they are valued. The training creates a supportive workplace. Employees may gain access to training they wouldn't have otherwise known about or sought out themselves. Employees who feel appreciated and challenged through training opportunities may feel more satisfaction toward their jobs.

Training is an investment employers make in their work force. When companies offer training and education to their employees, they indicate that they value their people and the contributions they make. They also send a message that the organization values progress -- both in organizational achievements as well in the careers of its people. Naturally, this creates attachment, loyalty and enthusiasm among staff.

Lowers the Turnover Costs

Keeping well-trained employees pays off significantly for companies because the cost of employee turnover can be high. Costs include separation costs, such as exit interviews, administrative functions related to termination, severance pay and unemployment compensation. Replacement costs consist of attracting applicants, entrance interviews, testing, travel and moving expenses, pre-employment administrative expenses, medical exams and supplying employment information.

Studies show that the cost of replacing employees increases with the level of the employee.

Career Development

Many workers join their organizations not just to have a job but to develop a career. Opportunities for advancement are essential to employee retention and performance. However, if these prospects exist only in theory, workers can become disenfranchised. Training helps employees realize their goals by giving them the education they need not only to do their jobs better but to learn about new aspects of business and even higher-level managerial skills they can use down the line.





By Irene Njoroge

People travel to various destinations for various occasions and reason, so to make travelling fun and memorable, here are some of the tips on how to prepare and to make your travel experience unforgettable:

1. Learn Common Phrases of the Local Language

A simple “Please,” “Thank you,” and “I’m sorry” in the local language goes a long way

2. Make Photocopies of Important Documents

3. Put Your Room Number & Hotel Address in Your Phone

4. Beware of Free Public WIFI

Always try to avoid logging into bank accounts or entering any passwords while using free public WIFI at a place like an airport.

5. Take lots of Photos

You may only see these places & meet these people once in your lifetime. Remember them forever with plenty of photos. Don’t worry about looking like a “tourist”. Great photos are the ultimate souvenir.

6. Pack essentials in your carry-on.

7. Research local customs so you’re prepared for when you arrive

8. Move around the cabin regularly. This will help reduce swelling in your ankles and feet and increase circulation.

9. Leave a good impression of your culture on the countries you are visiting.

10. Do as much local as you can: local food, local transport, local accommodation.

THE INTERVIEW



Kapis Goga Ondiegi is an Environmental Scientist working with the Kenya Nuclear Electricity Board. The soft-spoken, unassuming and reflective personality is eager to carve a few notches in the process of Kenya's nuclear power development. He spoke with The Fission magazine's Dennis Nkonge on his highs, lows, personality traits, reflections on life, career and a lot more.

Now you are working for KNEB, apart from the job, what else do you do, on the sidelines?

I'm a part time academic research writer, working online with Academia-Research, which is a leading company in academic

writing. The work comprises of writing essays, research papers, editing, proofreading, formatting and data analysis.

What is the most memorable moment in your life?

I can say that some moments are nice, some are nicer, and some are worth writing and remembering. Besides, they are called "moments" because they don't last longer. To me, the memorable moment(s) is that day my guardian accepted to help sponsor my studies at the university. Hopes to pursue my career was restored that very moment and I believe more is yet to come.

Which character trait defines you the most?

I am a role model for integrity, generosity, kindness, responsible and honesty, traits that impact happiness in my life and mutual coexistence with people around

me. The trait that defines me most, just like the greatest commandment, is LOVE (Mathew 22:36-40).

So, what's your driving force in life?

In all conscience, self-improvement. I am from a humble background and I know I was born for a purpose, something more than my foundation. As long as I am healthy, I remain relentless to self-improvement because I have determination, the reason to soldier on and a purpose for existence even in the most severe and limiting circumstances to improve myself.

What are your hobbies?

Cycling! Over the years, I have come to understand that cycling is more of a psychology than a physical exercise. The grind, has taught me to face challenges head on, because finishing a goal and realizing the distance covered in a journey is the true reward. Following my profession as an Environmental Scientist, it fits perfectly since I am concerned about carbon emissions and environmental conservation.

Let us now focus a bit more on your current job at KNEB. What's the greatest challenge that you have encountered?

For now, I cannot talk of challenges because KNEB staff have been so supportive and I strive to remain indifferent to the challenges I might face. If the goal is noble, whether or not it is realized within my lifetime is largely irrelevant. My purpose is to strive, persevere and get things done but if I fail, I pass the challenge to others.

If you could start all over again, would you change your career path in any way? Why?

Not really, I have a passion for environmental matters and that is the reason I chose to follow the path. Having done a Diploma in Wildlife Conservation and Management and, BSc. Environmental Science, I am still

optimistic to undertake Masters in Environmental Governance, to help change the world before it changes me.

In your view, would nuclear electricity help Kenya?

Nuclear electricity will truly help Kenya in a big way. Once we go nuclear, there will be affordable and more reliable energy that will attract investors and hence development of industries and better infrastructure that will ensure service delivery. With the issue of climate change a real and imminent danger, Kenya investing in clean energy is essential as well as to be realistic about solutions to climate change and energy that can drive the economy.

If someone asked you to justify why nuclear electricity is a good option for Kenya, what would your response be?

Nuclear electricity is the best option for Kenya, despite the global controversies. Nuclear power is the backbone providing more than half of electricity needs in developed countries. With the vision 2030 aim of transforming Kenya into a newly industrializing, middle income country, it is inevitable for the country not to establish a base load power, and nuclear electricity is the sure way to go.

What do you consider to be your major achievement in your career so far?

Staying focused on my career and working in an organization that enables me to demonstrate my proficiency is an achievement. The major achievement is yet to come because I am still 'updating my software' and God did not create me a 'junk', I still have a lot more to offer.

THE END



Top & Below: Kapis following through the proceeding of meetings with different stakeholders during the SESA workshops in which he plays a key role.



KNEB BOARD MEMBERS



Eng Joseph Noroge
PS Energy & Petroleum



Dr Kamau Thugge
PS National Treasury



Prof Colleta Suda
PS Science & Technology



Prof Githu Muigai
Attorney General



Eng. Collins Juma
KNEB CEO



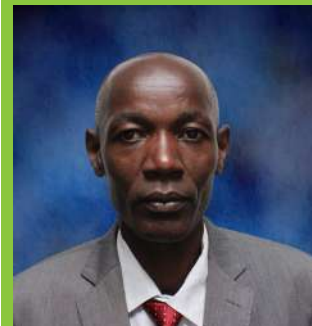
Ms. Josephine O. Sinyo
Board Member



Mr. Ernest C. Orito
Board Member



Ms. Teresiah Mbaika
Board Member



Mr. Stephen M. Karanja
Board Member



Ms Belinda Kiilu
Alternate to the
Attorney General



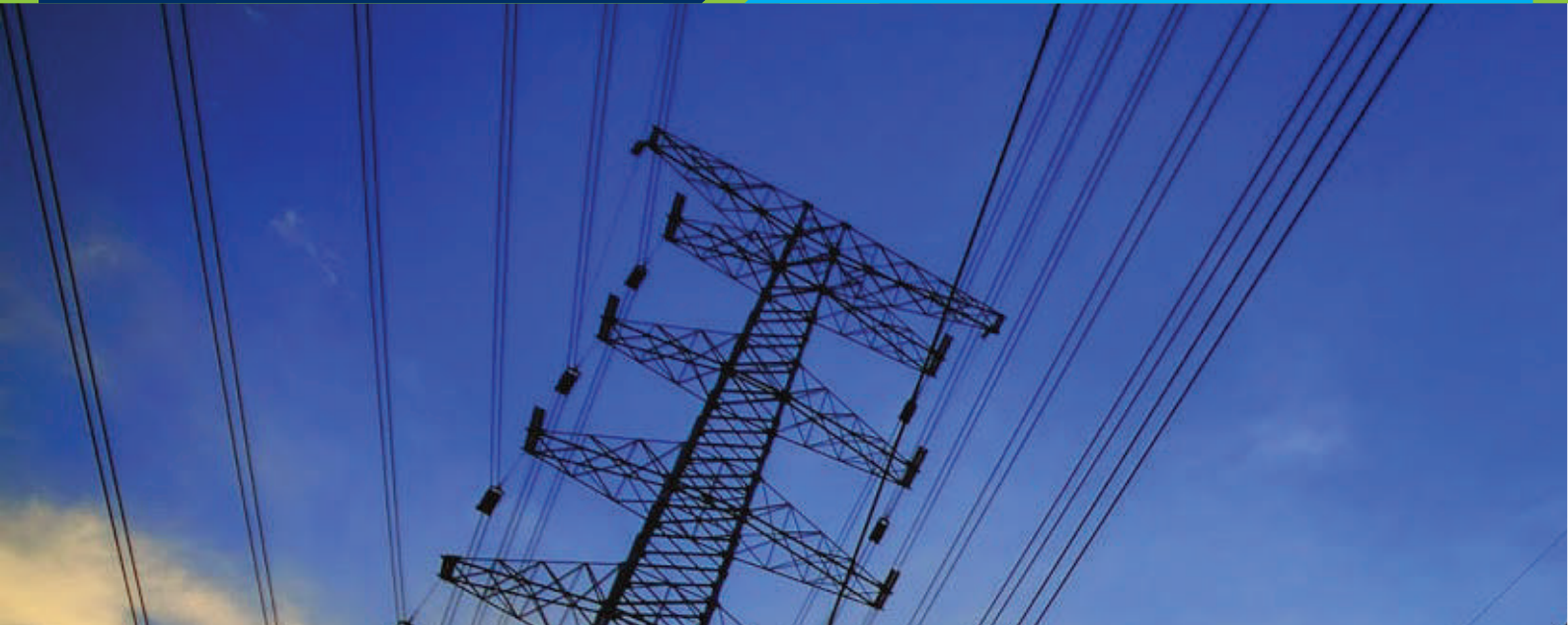
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