

**PARLIAMENT OF KENYA**



**THE NATIONAL ASSEMBLY**

**ELEVENTH PARLIAMENT**

**FOURTH SESSION - 2016**



**THE DEPARTMENTAL COMMITTEE ON ENERGY,  
COMMUNICATION AND INFORMATION**

**REPORT ON THE VISIT TO NUCLEAR PLANTS IN CHINA  
11<sup>TH</sup> AND 19<sup>TH</sup> JUNE, 2016**

**Directorate of Committee Services  
Clerk's Chambers,  
Parliament Buildings  
Nairobi**

**AUGUST, 2016**

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## **CHAIR'S FOREWORD**

The Committee on Energy, Communication and Information has had several engagements with the Kenya Nuclear Electricity Board (KNEB) on issues pertaining to nuclear power plants and the aspiration of Kenya to build nuclear power plants in the country in future. The Kenya Nuclear Electricity Board thought it important for members of the Committee to visit an operating nuclear power plant in order to better understand the conditions and requirements of such plants.

The main aim of the visit was to among other things give Members of the Committee an opportunity to visit a nuclear plant and to allay myths that they may have heard about nuclear energy. The visit was also important as it would enable members come face to face with the benefits of nuclear energy in a country. This in turn will make it possible for members to give an informed opinion on nuclear energy to the Committee, House and the Government at large.

The Committee is thankful to the Office of the Speaker and the Clerk of the National Assembly for the logistical and technical support accorded to it before, during and after the visit.

On behalf of the Committee and Pursuant to the Standing Orders of the National Assembly, it is therefore my pleasant duty and privilege, to lay this report on the visit to China for consideration and approval by the House.

**THE HON. JAMLECK KAMAU, EGH, M.P.**  
**CHAIRPERSON**

## **EXECUTIVE SUMMARY**

The purpose of this report was to present the findings of the Departmental Committee on Energy, Communication and Information delegation on the trip to China between 11<sup>th</sup> and 19<sup>th</sup> June, 2016.

A delegation of the Departmental Committee on Energy, Communication and Information undertook a visit to nuclear plants in China. The delegation comprised of five Members of Parliament drawn from the National Assembly, one parliamentary staff and two officials from the Kenya Nuclear Electricity Board.

During the visit, the delegation held a meeting with the China General Nuclear Power Corporation where they were given a brief on nuclear energy and the benefits that China had attained so far from the same. The Committee further undertook a guided tour of the CGN offices and the Daya Bay Nuclear Power Operations and Management Company Limited.

In considering the report of the visit to China, the Committee held Sitzings and reviewed the visit China so as to make recommendations. The report concludes that the Kenya Nuclear Electricity Board is facilitated in order to fulfill its mandate within the stipulated time.



## **ESTABLISHMENT OF THE COMMITTEE**

The Departmental Committee on Energy, Communication & Information is one of the twelve Departmental Committees of the National Assembly established under *Standing Order 216* whose mandates pursuant to the *Standing Order 216 (5)* are as follows:

- a) To investigate, inquire into, and report on all matters relating to the mandate, management, activities, administration, operations and estimates of the assigned ministries and departments;
- b) To study the programme and policy objectives of ministries and departments and the effectiveness of their implementation;
- c) To study and review all the legislation referred to it;
- d) To study, access and analyse the relative success of the ministries and departments measured by the results obtained as compared with their stated objective;
- e) To investigate and inquire into all matters relating to the assigned ministries and departments as may be deemed necessary, and as may be referred to it by the House or a Cabinet Secretary;
- f) To vet and report on all appointments where the Constitution or any law requires the National Assembly to approve, except those under Standing Order No.204 (Committee on appointments); and
- g) To make reports and recommendations to the House as often as possible, including recommendations of proposed legislation.

## **MANDATE OF THE COMMITTEE**

In accordance with Second Schedule of the Standing Orders, the Committee is mandated to oversee:-

Fossil fuels exploration, Development of energy, Production of energy, Maintenance and regulation of energy, Communication, Information, Broadcasting, Information Communications Technology (ICT) development and management.

In executing its mandate, the Committee oversees the following government Ministries, namely:

- i. Ministry of Energy and Petroleum
- ii. Ministry of Information, Communication and Technology

## COMMITTEE MEMBERSHIP

The Committee on Energy, Communication and Information was constituted by the House in May, 2013 and comprises of the following Members:-

<b>Chairperson</b>	The Hon. Jamleck Kamau, EGH, MP
<b>Vice Chairperson</b>	The Hon. Jackson Kiptanui, MP
<b>Members</b>	The Hon. Mohammed Elmi, EGH, MP
	The Hon. (Eng) James Rege, MP
	The Hon. Edick Anyanga, MP
	The Hon. Mithika Linturi, MP
	The Hon. Mary Mbugua, HSC, MP
	The Hon. (Eng.) Vincent Musau, MP
	The Hon. Zebedeo Opore, MP
	The Hon. Aramat Lemanken, MP
	The Hon. Arthur Odera, MP
	The Hon. Banticha Abdullahi, MP
	The Hon. Esther Gathogo, MP
	The Hon. Fathia Mahbub, MP
	The Hon. James Lomenen, MP
	The Hon. Aburi Mpuru, MP
	The Hon. Cecily Mbarire, MP
	The Hon. Nicholas Ngikor, MP
	The Hon. Onesmus Njuki, MP
	The Hon. Rachael Amolo, MP
	The Hon. Roba Duba, MP
	The Hon. Ndung'u Gethenji, MP
	The Hon. William Kisang, MP
	The Hon. Richard Tongi, MP
	The Hon. Moses Kuria, MP
	The Hon. Silverse Anami, MP
	The Hon. Charles Nyamai, MP
	The Hon. Joseph Magwanga, MP
	The Hon. William Mtengo, MP

## COMMITTEE SECRETARIAT

<b>Clerk Assistant</b>	Mr. Amos Sikweya
<b>Clerk Assistant</b>	Mr. Jimale Mohammed
<b>Clerk Assistant</b>	Ms. Lauren Wesonga

<b>Legal Counsel</b>	Ms. Jemimah Waigwa
<b>Research &amp; Policy Analyst</b>	Mr. Donald Manyala
<b>Fiscal Analyst</b>	Mr. Abdirahman Gorod

## **LIST OF RECOMMENDATIONS**

The Committee recommends that:

1. The Kenya Nuclear Electricity Board should be adequately funded in order to properly execute its mandate especially in boosting public acceptability of nuclear energy.
2. More members of the Committee, the National Assembly and the Ministry should get a chance to visit operational nuclear plants in the world so that they can learn more on nuclear energy in addition to knowing the advantages and disadvantages of nuclear energy.
3. The Kenya Nuclear Electricity Board should ensure that all stakeholders are involved in each step that they undertake in order to avoid fall outs,
4. The Kenya Nuclear Electricity Board in consultation with the Ministry of Energy and Petroleum should work on a way of ensuring that more Kenyans are trained on nuclear energy so that there is enough man power when the plant is set up in the country.

## **1 INTRODUCTION**

The Departmental Committee on Energy, Communication and Information is established and mandated under Standing Order No. 216 to inter alia: -  
investigate, inquire into and report on all matters relating to the mandate, management, activities, administration, operations and estimates of the assigned Ministries and Departments;

The Committee on Energy, Communication and Information has had several engagements with the Kenya Nuclear Electricity Board (KNEB) on issues pertaining to nuclear power plants and the aspiration of Kenya to build nuclear power plants in the country in future. The Kenya Nuclear Electricity Board therefore invited the Committee for a visit to an operating nuclear power plant in order to better understand the conditions and requirements of such plants.

A delegation of the Departmental Committee on Energy, Communication and Information took part in the visit to China between the 11th and 19th June 2016.

The delegation comprised of the following Members of Parliament drawn from the National Assembly: -

1. Hon. Jackson Kiptanui, MP – **Leader of delegation**
2. Hon. Esther Gathogo, MP
3. Hon. Aburi Mpuru, MP



4. Hon. Racheal Amolo, MP
5. Hon. Zebedeo Opore, MP

The Parliamentary Staff who accompanied the delegation was: -

1. Ms. Lauren Wesonga – **Clerk Assistant / Delegation Secretary**

Eng. Collins Juma, the Ag. Chief Executive Officer, Kenya Nuclear Electricity Board and Dr. Anderson Kipkoech, Board Member, Kenya Nuclear Electricity Board also accompanied the delegation during the visit.

The objectives of this visit were to among other things: -

- i. **To visit a nuclear power plant in order to better understand the conditions and workings of such a plant.**
- ii. **To share experiences in the energy sector.**
- iii. **To allay the fears that Members may have on nuclear energy.**
- iv. **To assess the advantages and disadvantages of a nuclear power plant.**



## **2 VISIT TO THE CHINA GENERAL NUCLEAR POWER CORPORATION OFFICES**

### **2.1 INTRODUCTION**

Kenya targets to be a middle income country by 2030 and the amount of power on the national grid is important in making this possible, nuclear power is one of the ways through which more power can be generated to the national grid. Currently, Kenya's national grid has 2000MW generated from hydro, geothermal, solar and wind. One nuclear plant is capable of generating 100% of what is being generated currently.

Nuclear power is therefore expected to be the next thing that will spear development in Kenya in the near future. However, the country has a long way to go in terms of developing the path to nuclear program. The Kenya Nuclear Electricity Board was formed in 2010 and is working towards setting up the first nuclear plant in Kenya. The government's target was to set up the first nuclear plant by 2020 but this won't be possible because of the intensive work needed, the new target is 2027.

Kenya approached the International Atomic Energy Agency and international partners to give their advice on nuclear energy which they have done so well. The International Atomic Energy Agency conducted a feasibility study and handed over the report to the Kenyan government in February, 2016. The laws on the same are being reviewed by the State Law Office and will be out soon. The final report on the grid study is being prepared in Shanghai, China and will be ready soon. This shows that Kenya has made commendable steps towards achieving the dream of having a nuclear plant in the country.

### **2.2 REMARKS FROM THE CHINA GENERAL NUCLEAR POWER CORPORATION**

CGN is the best nuclear company in China and it runs a total of 16 reactors in China. It uses the highest nuclear standards in the world and that's why they have adopted CPR 1000. CGN is 92% owned by Council of State and 8% owned by the Local Government. It is top 25 among the 120 state owned companies in China. CGN is the only company in China permitted to work with Kenya in nuclear energy.

Nuclear power is 45 years old in China and the Chinese government has a clear picture on the nuclear power programme. China will increase its clean energy production and nuclear is important in ensuring this. 8 to 10 nuclear reactors are set up each year in China.

### **2.2.1 Advantages of Nuclear Energy in China**

The following are the advantages of nuclear energy to China;

1. Improvement in technology. Availability of stable power has led to increased production which in turn has led to the development of more industries thus an improvement in technology.
2. The country's economy has improved. This is because of increased production in the country and the sale of electricity to neighboring countries. Increase in power production has led to an improvement in the transport system and this in turn has led to growth in the country's economy.
3. Power in the country is reliable and stable. Nuclear power does not depend on natural aspects like renewable energy thus more stable compared to renewable energy.
4. More jobs and supply chains have been created. One nuclear plant needs a total of six hundred professional staff and several support staff. It also provides indirect employment to several other people.
5. Production of most stuff locally unlike the previous years when they relied on imports. This is due to an increase in power that is stable and reliable.

### **2.2.2 Ways that China has used to boost public acceptability of nuclear energy**

Most people in China were opposed to nuclear energy and as such, the government employed the following ways to change their perception;

1. A lot of exhibitions – they used pictures, videos, workshops and invited guests from countries that had already set up nuclear plants in order to help their people understand and learn more about nuclear energy.
2. Nuclear power is part of the curriculum in their schools. This makes it possible for the citizens to know what nuclear energy is from an early age.
3. Build schools and other Community Social Responsibility activities helped the people know that nuclear energy can be beneficial to the community and this in turn boosts acceptance.
4. Provide training on what nuclear energy is to community leaders who in turn pass the knowledge to the locals.

## **2.3 WAY FORWARD**

The meeting agreed on the following that;

1. CGN will help Kenya in developing a program for public awareness similar to the one used in China.



2. CGN will help Kenya conduct feasibility studies and other activities.
3. CGN will bring a mock-up on the open day that will be held in Kenya in September.
4. A meeting will be organized between the Cabinet Secretary, Ministry of Energy and Petroleum, Kenya with his China counterpart, officials from the Kenya Nuclear Electricity Board and officials from CGN.

### **3 A VISIT TO DAYA BAY NUCLEAR POWER OPERATIONS AND MANAGEMENT COMPANY LIMITED**

Daya Bay is located at Dapeng Peninsula on the Coast of South China Sea, Daya Bay in Longgang District, Shenzhen Guangzhou China North East of Hong Kong. It has two nuclear reactors that started commercial operation in 1993 and 1994 respectively. Daya Bay Nuclear Power Operations and Management Company Limited (DNMC) is responsible for the operations management of the base.

#### **3.1 ENVIRONMENTAL PROTECTION**

Compared with coal fired power stations of identical capacity, the six units of 1000MWe in Daya Bay Nuclear Power Site have reduced consumption and release of coal – 14.80 million tons, CO<sub>2</sub>– 36.5 million tons, SO<sub>2</sub> – 0.35 million tons and NO<sub>x</sub> – 0.23 million tons. This has resulted in 100,000 hectares of forest planting.

#### **3.2 ENVIRONMENTAL MONITORING**

Statistics of the ten monitoring stations within a radius of 10kms of Daya Bay Nuclear Power Site has shown that there has been no obvious changes in terms of radioactivity of Daya Bay Nuclear Power Site compared to the background figures obtained prior to the commercial operations.

#### **3.3 SAFETY OF NUCLEAR POWER STATIONS**

The nuclear plants have pressurized water reactors with multiple safety design features. Each reactor has been built with three separate protective barriers, i.e. fuel rod cladding, reactor pressure vessel and containment building, to prevent the escape of any radioactive material due to accidents at the stations.

According to the information published by the Hong Kong Nuclear Investment Company Limited, all abnormal events that occurred at the GNPS during the past ten years were classified as level one or level zero based on the International Nuclear and Radiological Event Scale of the

International Atomic Energy Agency. This means that they are of no safety consequence or no safety significance. Furthermore, the number of abnormal events in recent years was getting less.

#### 4 OBSERVATIONS

The delegation made the following observations;

1. People were leaving close to the nuclear plants; some were housed within the nuclear plant compound.
2. There was natural vegetation around the nuclear plants.
3. Areas around the nuclear plants were highly developed.
4. The transport system in China is well developed and electricity generated through nuclear power has been used to enhance this through trumps and electric trains.
5. Staff in the nuclear plants are well trained judging from their output and interaction with the delegation.
6. Life around the nuclear plants is as normal as life in any other place.

#### 5 RECOMMENDATIONS

The Committee recommends that:

1. The Kenya Nuclear Electricity Board should be adequately funded in order to properly execute its mandate especially in boosting public acceptability of nuclear energy.
2. More members of the Committee, the National Assembly and the Ministry should get a chance to visit operational nuclear plants in the world so that they can learn more on nuclear energy in addition to knowing the advantages and disadvantages of nuclear energy.
3. The Kenya Nuclear Electricity Board should ensure that all stakeholders are involved in each step that they undertake in order to avoid fall outs,
4. The Kenya Nuclear Electricity Board in consultation with the Ministry of Energy and Petroleum should work on a way of ensuring that more Kenyans are trained on nuclear energy so that there is enough man power when the plant is set up in the country.

Signed.......... Date.....16/08/2015.....

**THE HON. JAMLECK KAMAU, EGH, M.P. CHAIRPERSON,  
DEPARTMENTAL COMMITTEE ON ENERGY, COMMUNICATION &  
INFORMATION**