MINISTRY OF LABOUR AND SOCIAL PROTECTION

STATE DEPARTMENT FOR LABOUR

REPORT ON

SKILLS PROFILE IN THE ENERGY SECTOR IN KENYA

MAY 2020

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FOREWORD

The Kenya Vision 2030 is the country's development blue print which aims at transforming Kenya into a globally competitive and prosperous nation by the year 2030. The Vision identifies education and training as one of the levers that will drive the country into becoming an industrialized and middle-income economy under the social pillar. It places great emphasis on the link between training and industry and the need to create entrepreneurial skills and competencies.

Kenya's global competitiveness depends on the county's ability to create an adaptive human resource base with the requisite skills that are in tandem with the dynamics of the rapidly changing domestic and international labour market.

The Third Medium Term Plan (MTP III) 2018-2022 of the Kenya Vision 2030 is implemented through the Big 4 agenda which identifies Manufacturing, Universal Health Care, Affordable Housing and Nutrition and Food Security as key sectors to fast track economic growth and development. This will lead to increased industrialization and urbanization with a corresponding rise in household demand for energy.

Energy therefore becomes one of the critical infrastructural enablers towards achievement of the Big 4 agenda and Kenya is expected to generate and use more energy towards realization of both Vision 2030 goals and the Big 4 agenda.

Kenya recently discovered new sources of energy such as oil, gas, geothermal, wind and coal. Further exploration of these resources is ongoing. The development of this sub-sector will depend on the availability of the right mix of skills.

The Ministry of Labour and Social Protection is mandated to provide Labour Market Information for policy guidance on human resource planning and development for efficient functioning of both the local and international labour markets.

The Ministry through the Department of National Human Resource Planning and Development undertook a survey covering Electricity Generation and Transmission; Fossil Energy Extraction and Energy Exploration sub-sector activities and made recommendations and intervention measures.

I am optimistic that the findings and recommendations of the Energy Sector Survey Report will be invaluable to policy makers, human resource and development practitioners, education and training institutions, the private sector and all other stakeholders.

HON. SIMON K. CHELUGUI, EGH
CABINET SECRETARY,
MINISTRY OF LABOUR AND SOCIAL PROTECTION

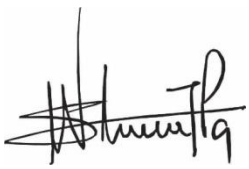
PREFACE

The State Department for Labour is mandated with the provision of accurate, reliable, timely and up to date Labour Market information. The assessment of sectoral skills is one of the regular activities carried out by the State Department through its Department of National Human Resource Planning and Development. These sectoral surveys are the sources of data and information used in updating the Kenya Labour Market Information System (KLMIS). This necessitated the survey on skills profile in the energy sector.

The survey on skills profile in the energy sector in Kenya was to establish the types and levels of skills, employment and skills demands, skill gaps and future skills requirements within the sector. The survey covered both upstream (exploration) and mid-stream (refinery, storage and transmission) segments of the energy sector. The sub-sectors included energy extraction, electricity generation and transmission and energy exploration. Key to note is that a number of occupations could not be effectively classified as per the Kenya National Occupations Classification Standard (KNOCS).

Data collected during the survey was analyzed taking into consideration key parameters. One such parameters is the International Labour Organization (ILO) requirement for sex disaggregated data aimed at illustrating the male and female ratio. The KNOCS coding system was used to aggregate the occupations and International Standard Classification of Education (ISCED-1997) fields of education under United Nations Educational, Scientific and Cultural organization (UNESCO) coding to aggregate the skill areas.

The survey report contains a number of findings and recommendations that provide a platform for intervention measures and further engagement with the stakeholders in the energy sector.



HON. PATRICK OLE NTUTU
ADMINISTRATIVE SECRETARY,
MINISTRY OF LABOUR AND SOCIAL PROTECTION

ACKNOWLEDGEMENT

First and foremost, I wish to acknowledge the Cabinet Secretary, Ministry of Labour and Social Protection, Hon. Simon Chelugui for providing strategic policy direction during this important national undertaking and the Chief Administrative Secretary, Hon. Patrick Ole Ntutu for his technical and moral support.

Secondly, I appreciate the role played by the Cabinet Secretary, Ministry of Energy, Hon. Charles Keter and Cabinet Secretary, Ministry of Petroleum and Mining, Hon. John Munyes for their unwavering support in mobilizing agencies in their ministries to provide data during this important survey.

The management of Geothermal Development Company (GDC), Independent Power Providers (IPPs), Kenya Electricity Generating Company (Ken Gen), Kenya Electricity Transmission Company Limited (KETRACO), Kenya Nuclear Electricity Board (KNEB) Kenya Pipeline Company (KPC), Kenya Power and Lighting Company (KPLC), Tullow Oil (Kenya) and Rural Electrification and Renewable Energy Corporation (REREC) are greatly appreciated for providing unlimited access and interrupting their busy schedules to grant audience to our officers collecting data for the survey both at their headquarters and field stations.

I wish to acknowledge the staff of the State Department for Labour who participated in the survey or contributed in one way or the other to its success.

Finally, I appreciate the staff of National Human Resource Planning and Development Department under the leadership of Mr. Francis Mitiambo for a job well done.

HON. PETER TUM, OGW
PRINCIPAL SECRETARY,
MINISTRY OF LABOUR AND SOCIAL PROTECTION

EXECUTIVE SUMMARY

Energy is a critical enabler in the realization of the national development agenda and has productive inter-linkages with other socio-economic activities such as industrial, services, agricultural, commercial, social institutions and households. The importance of the sector is further emphasised for its potential as a main driver of the country's vision towards the attainment of the middle income economy status as envisaged in the Kenya Vision 2030 and Big four agenda hence the need to establish the skills profiles in the sector.

The report is organized into four (4) chapters: Chapter one (1) Background and methodology, Chapter Two (2) Data Analysis, Chapter Three (3) Summary of the Findings and Chapter Four (4) Conclusion and Recommendations

The objectives of the study were to establish types and levels of skills, employment and skills demand, skill gaps, and to determine immediate and future skills requirements in the sector. The Survey was conducted through personal interviews using a structured questionnaire targeting employers in the sector covering upstream (exploration, extraction and generation) and mid-stream (refinery, storage and Transmission). Enterprises covered entailed the following activities: Fossil energy extraction, Electricity generation and transmission and; Energy exploration.

The Survey established that the sub-sector with the highest number of employees was energy generation followed by transportation and transmission. Technicians and Associate Professionals major occupational group had the highest number of employees followed by professionals' major occupational group.

Overall, male employees constituted 75 percent of all employees. There were a total of 92 Skill Areas and 7 categories of Skill Levels in the sector. The predominant Skill Area in the Energy sector was Electrical Engineering Technology followed by Business and Administration.

Transportation sub-sector had the highest number of vacancies followed by Transmission sub-sector. The highest numbers of vacancies were in Engineering and Engineering Trades and Physical Sciences Skill Areas.

Majority of establishments preferred future workers with Diploma and Artisan Skill Levels. Engineering and Engineering Trades, Physical Sciences and; Business and Administration, were the preferred future Skill Areas.

The Survey recommends the need to strengthen the linkages between industry and training institutions in order to identify skills mismatch and future skills requirements in the labour market with a view of reviewing curriculum to accommodate emerging occupations.

ACRONYMS AND ABBREVIATIONS

EAC: East African Community

ISCED: International Standard Classification of Education.

KNOCS: Kenya National Occupation Classification Standard

SPSS: Statistical Package for Social Scientists

UNESCO: United Nations Educational, Scientific and Cultural Organization.

OPERATIONAL DEFINITION OF TERMS

- **Technical employees:** These are workers who possess special and practical knowledge to execute the core mandate of the energy sector e.g. electrical engineers, geologists, cartographers, plant operators among others.

- **Non-Technical employees:** These are workers who possess special and practical knowledge in support of administrative functions in the execution of the core mandate of the energy sector e.g. accountants, lawyers, human resource, messengers among others.

- **Transportation:** This refers to the process of moving energy products from one point to another.

- **Distribution:** It refers to the movement of energy products from the source through a distribution channel, right up to the final customer, consumer, or user, and the movement of payment in the opposite direction, right up to the original producer or supplier.

- **Generation:** This is the production of energy in a particular form e.g hydro-electric, geothermal, wind, solar power generation.

- **Regulation:** Principle or rule employed in controlling, directing, or managing energy activities.

- **Transmission:** The transportation of produced electric energy to loads by an electric power transmission system that interconnects generators and loads and generally provides multiple paths among them.

- **Occupation:** Is a set of jobs which have a high degree of similarity in the tasks and duties performed.

- **Major Occupation group:** This refers to the design and structure of the occupational classification system in the KNOCS and in terms of hierarchy, it's the first level of classification in KNOCS.

- **Minor Occupation group:** This refers to the design and structure of the occupational classification system in the KNOCS and in terms of hierarchy, it's the third level of classification in KNOCS.

- **Skill level:** refers to certification categories of education and training approved by Kenya National Qualifications Authority. Examples of certifications include PhD, Bachelors, Diploma, and Artisan among others.

- **Skill area:** It's a specialized field of knowledge, abilities, and experience necessary to perform a job. Specific skills set areas include geology, cartography, electrical engineering, human relations, research and planning, accounting, leadership, management, and computer skills among others.

- **Energy extraction:** This refers to the process of harnessing energy from a natural source. Example oil, gas and coal.

CHAPTER ONE

1.0 Background

1.1 An overview of global energy sector

In the United Kingdom, the sector's structure broadly shows that, although there are more large employers than in most other sectors, as well as a growing number of small businesses, and a relatively high proportion of employees in the sector who are process or plant operatives (17 per cent compared with six per cent across all sectors) ,the sector's workforce is older than that of other sectors and the average age of managers and professionals working in the sector is increasingly relatively fast, suggesting low inflows of younger people to these roles.

On the demand side, demand for skilled labour in the sector is expected to rise over the next decade (Wilson and Homenidou, 2011). Workforce qualification levels are expected to increase significantly by end of 2020.

The percentage of people with the equivalent of a university degree (Level 4 qualification) in the sector will increase from 15 per cent in 2000 to 28 per cent in 2020 .Those with mid-level qualifications in the sector will remain relatively unchanged where 18 per cent of all workers are expected to have Level 3 qualifications, 19 per cent Level 2, and 14 per cent for people without any qualifications in sector. Similarly, there will be a relatively lower share of people with postgraduate qualifications in the sector (seven per cent) compared to the rest of the economy (15 per cent). This situation is not much different in many other countries.

According to European wind energy technology report (August 2013), In EU, Nearly 50,000 additional trained staff will be needed by the wind energy sector alone by 2030. By that year, operations and maintenance will become the greatest source of new jobs and demand for trained staff. There is currently a shortage of 7,000 qualified personnel required by the European wind energy sector each year, a figure that could increase to 15,000 by 2030 if the number of graduates taking courses relevant to the industry does not rise.

There is also an economy wide concern about the low number of graduates from schools and universities opting for science, technology, engineering and mathematics (STEM) courses. This is a particular concern for the wind and other renewable energy industries, where availability of adequately trained staff is a problem. It is estimated that the skills shortage is likely to be greatest in operations and maintenance (O&M) roles in the renewable energy sector. A minority of the renewable energy workforce is engaged in non-technical roles but the requirement could double by 2030, exacerbating the existing skills gap

Global, European and national policies and regulation all impact on the sector. The Kyoto Protocol requires a reduction in greenhouse gas emissions of 12.5 per cent by 2012, and the 2008 Climate Change Act set out an obligation to reduce greenhouse gas emissions by 34% by 2020 and 80% by 2050 (1990 baseline). This therefore means that more skills are required in the renewable energy sector.

1.2 An overview of Kenya's energy sector

According to Kenya Vision 2030, energy is one of the key infrastructural enablers of the three Pillars of the national development blue print. It should be noted that as economic growth increases and urbanization intensifies, household demand for energy also rises. Kenya is therefore expected to generate and use more energy towards realization of both Vision 2030 goals and the Big 4 agenda. The country also aims at creating a globally competitive and adaptive human resource base. This should also include human resource for the crucial energy sector.

The commercial energy sector in Kenya is dominated by petroleum and electricity as the prime movers of the modern sector of the economy, while wood fuel provides energy needs of the traditional sector including rural communities and the urban poor. The petroleum industry is broadly divided into three segments namely: upstream (exploration and production), mid-stream (storage, refining and transportation) and downstream (supply and distribution). The upstream segment primarily involves the processes of exploration, development and production of crude oil and natural gas. As there is no production in Kenya today, this segment is primarily involved in exploration.

The midstream segment involves processes around storage, refining and transportation of the crude oil into consumable oil and gas products. There is only one refinery in Kenya today which is the Kenya Petroleum Refineries Limited located in Mombasa. The downstream segment involves the process by which refined products are made available to the consumers through supply and distribution e.g. at industries and petrol stations. There is a fairly well developed network of transport pipelines, storage and retail outlets in Kenya today with a multiplicity of players.

A glimpse at the sector shows that specialized research and consultancy services have largely been internationally outsourced due to lack of locally available human capital within the economy. This situation is further aggravated by lack of enough specialized training programmes on energy in the country's institutions of higher learning.

There is also scanty data on the number of skilled personnel in this sector, and as the country continues to develop, it is expected that there will be a higher demand for human capital in the sector and hence the need to establish the current status of the human capital with a view to identifying any deficiencies of the available skills, trends in human capital development and employer investment.

1.3 Justification

In recent years, Kenya has discovered new sources of energy such as oil, gas, geothermal, wind, nuclear and coal and has enhanced exploration of these resources. These new sources of energy will spur economic growth, provide inter-linkages with other socio-economic activities and will be an enabler to the Big Four agenda by facilitating growth in manufacturing, health, housing and food security. The development of this sub sector will depend on the availability of the right mix of skills.

Currently, there is no sufficient data on the skill profiles in this sector. It is against this background that a study was undertaken to establish the skills available, their levels, types, quantity and quality in relation to manpower demand in the sector.

1.4 Objectives of the study

The main objective was to assess skills profile in the energy sector in Kenya.

The specific objectives of the study were as follows:

i. To establish the types and levels of skills possessed by the employees in the energy sector

ii. To establish employment and skills demand in the energy sector

iii. To establish skill gaps in the energy sector.

iv. To determine future skills requirements in the sector.

1.5 Scope

This study covered both upstream (exploration) and midstream (refinery, storage and transmission) segments of the energy sector. Enterprises covered entailed the following sub-classes of activities: Fossil Energy extraction, Electricity Generation and Transmission and energy exploration.

1.6 Methodology

The survey was conducted through a structured questionnaire covering employers. The survey was carried out in all targeted sub sectors in the energy sector mentioned under scope as well as in relevant regulatory bodies.

A self-administered questionnaire was used to collect data on various variables relating to; occupations, skill levels, skill types, vacancies, reasons for vacancies, sex, nationality, difficulties in meeting skills demand and how to address them, and Future skill requirements.

1.7 Limitations and Constraints

There were a number of challenges encountered during the execution of the Survey as follows:

- Some of the job titles in the establishments could not be matched with occupations in the current KNOCS.
- Some enterprises did not respond despite several call-backs.
- Records from various institutions were not uniformly maintained and not necessarily in the format required for the survey.

- Most enterprises in the field referred officers from the ministry to get the required data from their head offices which occasioned delays in data collection.

CHAPTER TWO: DATA ANALYSIS

2.0 Introduction

This chapter presents an analysis of data in the energy sector.

2.1 Data Processing

Data capture and analysis was done using the Statistical Package for Social Scientists (SPSS) and Excel. The Kenya National Occupations Classification Standard (KNOCS 2000) coding system was used to aggregate the occupations and International Standard Classification of Education (ISCED- 1997 and 2011) fields of education under UNESCO coding system to aggregate the skill areas.

2.2 Category and Nature of Enterprises in the energy sector

Enterprises in the Energy Sector in Kenya were classified as per the activity carried out either upstream (exploration) or midstream (refinery, storage and transmission) segments of the energy sector as indicated in Table 1.

Table 1: Energy Sector Classification by activity and product

S/No	Sub-Sector Activity	Product
1.	Electricity Generation and Transmission	• Hydro-Electricity • Geothermal Power • Nuclear Energy
2.	Fossil Energy Extraction	• Oil • Gas • Coal
3.	Energy Exploration	• Coal • Oil • Wind Power • Geothermal Power • Solar Power

2.3 Data Analysis

This section presents the summary of analysis of data under the following sub titles: employees by Major Occupational Group and Sub-Sector Activity; employees by Major Occupational Group; Citizenship and Sex; employees by Major Occupational Group and Skill Level; technical employees by Minor Occupational Group and Skill Level; non-technical occupations at Minor Group by citizenship and sex; Minor Occupational Group and Skill level for technical workers in the energy sub-sector; employees by Skill Area and Level; vacancies by Skill Area, nature of establishment, reasons for vacancies, difficulties faced in meeting demands for skilled personnel; and measures taken to address the difficulties; and future Skill Area requirements by Skill Level

2.3.1 Employees by Major Occupational Group and Sub-Sector Activity

This section presents a summary of employees by Major Occupational Groups and sub-sector categories.

Figure 1 shows distribution of employees by Major occupational groups. Technicians and Associate Professionals Major Occupational Group had the highest number of employees at 35 per cent. Employees in this Major occupational group included Engineering Technicians, Electrical Engineering Technicians, Chemical Engineering Technicians, Mining and Metallurgical Technicians, Mechanical Engineering Technicians, among others.

The second Major occupational group was Professional Major occupational Group accounting for 24 per cent. Employees in this group included Engineers, Electrical and electronic Engineers, Chemists, Mining and Metallurgical engineers, Mechanical Engineer, Production related Engineers, Geologist, and Instrumentation Engineers among others. Plant and machine operators and Assemblers Major occupational group was third accounting for 16 per cent while Skilled Farm, Fishery, Wildlife and Related Workers had less than 1 per cent of the total number of employees. For detailed analysis **(appendix 1).**

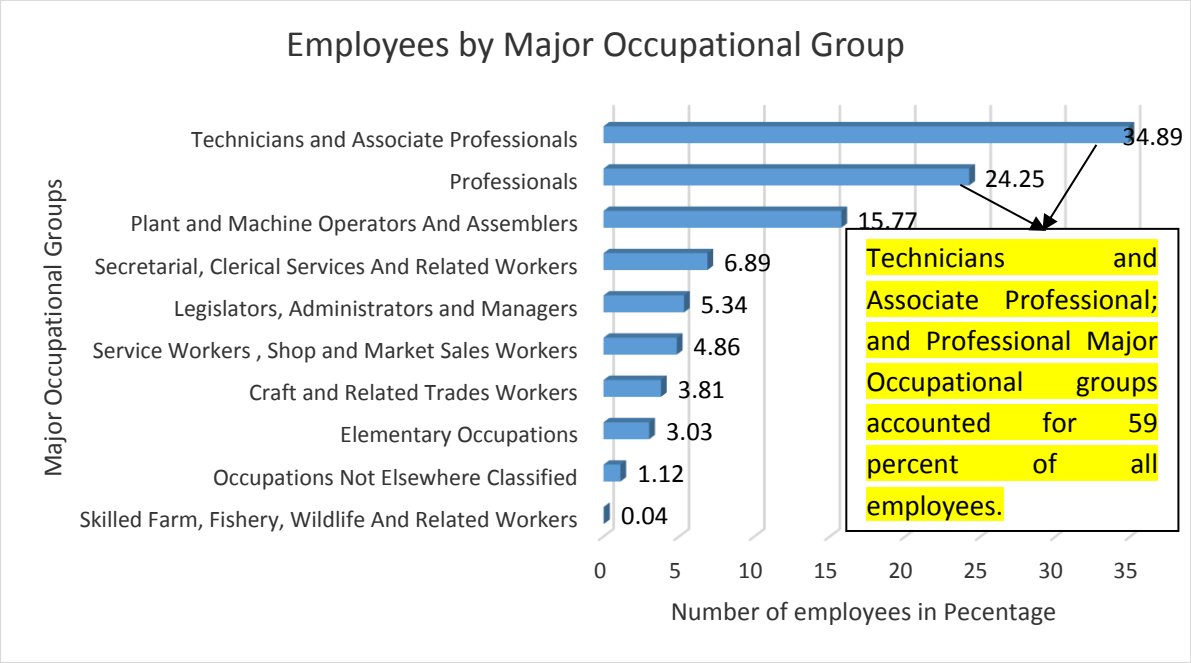


Figure1: Employees by Major Occupational Groups

Figure 2 shows the distribution of employees within the energy sector by sub-sector categories. The sub-sector with the highest number of employees was Energy generation at 52 per cent, followed by transportation at 27 per cent and transmission at 19 per cent. Distribution and regulation sub-sectors had the lowest number of employees with less than 1 per cent each.

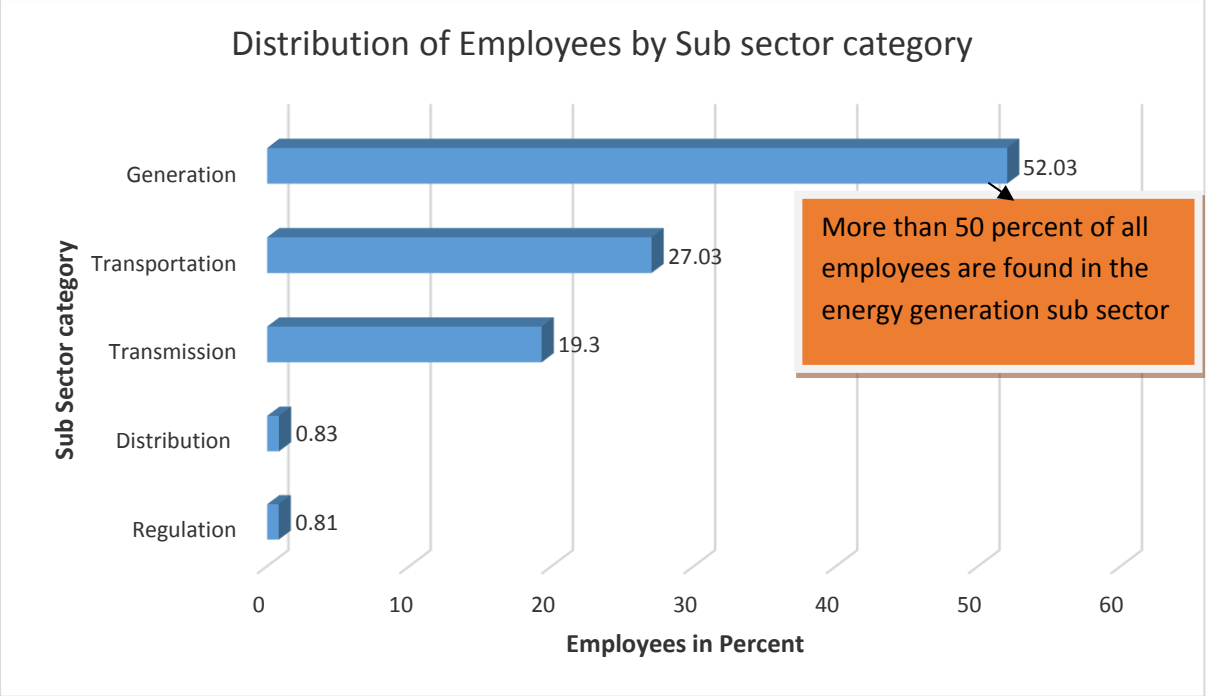
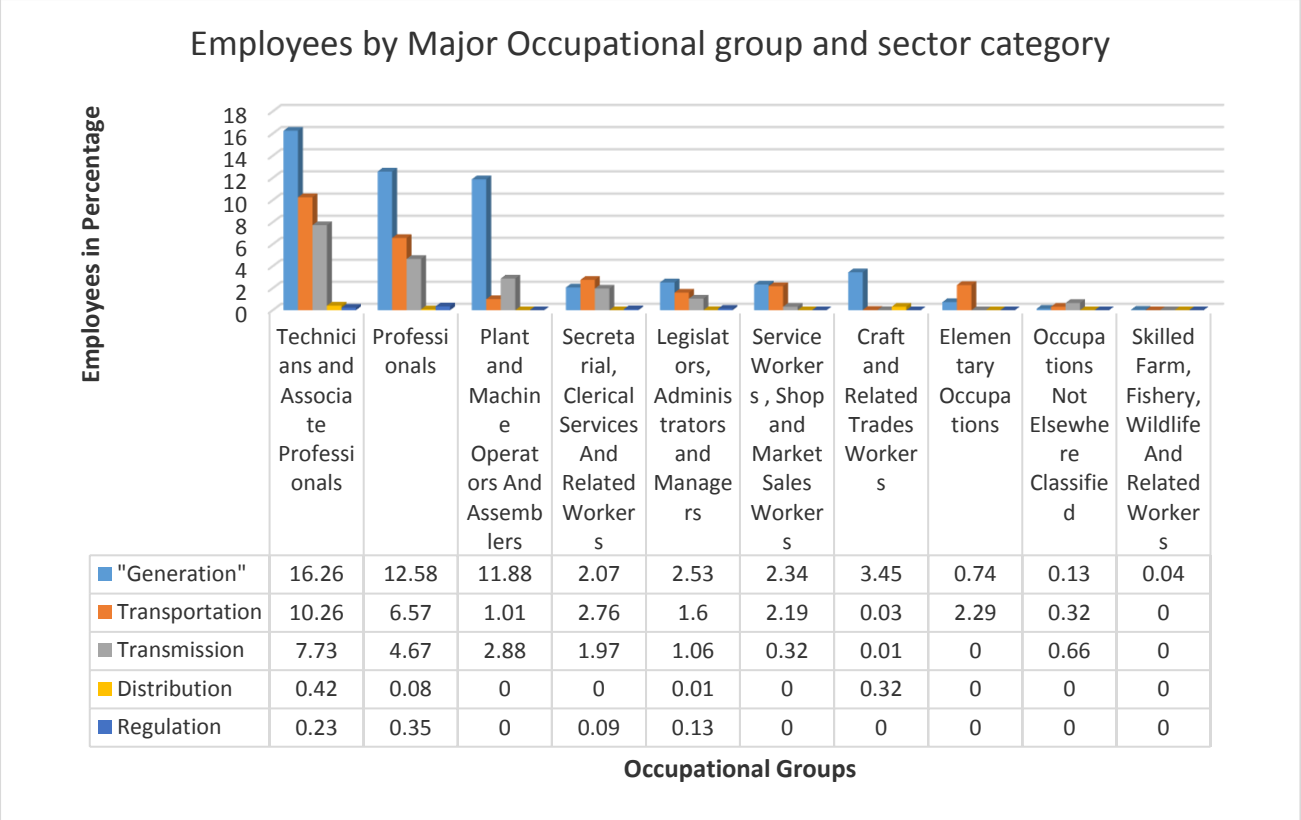


Figure 2: Employees by sub sector category

Figure 3 represents distribution of employees in the energy sector by Major occupational group and energy sub sectors. Establishments involved in generation of energy had most workers in Technician and associate professionals major groups (17%), Professional (13%) ;plant and machine operators (12%) ; legislators, Administrators and managers (3%); service workers, shop and market sales workers (2%); and craft and related trade workers (4%). On the other hand, secretarial, clerical services and related workers (3 %) and elementary occupations (2%) Major Occupational groups recorded the highest number of employees within Transportation sub sector.



	Technicians and Associate Professionals	Professionals	Plant and Machine Operators And Assemblers	Secretarial, Clerical Services And Related Workers	Legislators, Administrators and Managers	Service Workers , Shop and Market Sales Workers	Craft and Related Trades Workers	Elementary Occupations	Occupations Not Elsewhere Classified	Skilled Farm, Fishery, Wildlife And Related Workers
"Generation"	16.26	12.58	11.88	2.07	2.53	2.34	3.45	0.74	0.13	0.04
Transportation	10.26	6.57	1.01	2.76	1.6	2.19	0.03	2.29	0.32	0
Transmission	7.73	4.67	2.88	1.97	1.06	0.32	0.01	0	0.66	0
Distribution	0.42	0.08	0	0	0.01	0	0.32	0	0	0
Regulation	0.23	0.35	0	0.09	0.13	0	0	0	0	0

Figure 3: Employees by Major Occupational Groups and sub sector activity

2.3.2 Employees by Major Occupational Group, Citizenship and Sex

Table 2 provides a summary of employees by major occupation group, citizenship and sex in percentages.

Majority of the employees in the energy sector were Kenyan citizens across all Major Occupational Groups out of whom 75 percent were male. However, in the professionals and Legislators, Administrators and Managers, Major Occupational Groups there was a significant number of employees from other East African countries. The sex disparity was highest in Technicians and Associate Professionals Major Occupational Group where male constituted 28 percent and female 8 percent, followed by Plant and Machine Operators and Assemblers at 14 percent male and 2 percent female; and Professionals at 16 percent male and 6 percent female.

The highest variance between male and female was observed in Major Occupational Groups Technicians and Associate Professionals at 20 percent, followed by Plant and Machine

Operators and Assemblers at 12 percent and Professional Major Occupational Group at 10 percent

Table 2: Employees by Major Occupational Group, Citizenship and Sex in percentage

Major Occupational Group	Citizenship and Sex								
	Kenyan		EAC		Others		Total		Total (%)
	Male	Female	Male	Female	Male	Female	Male	Female	
Legislators, Administrators And Managers	3.95	1.55	0.82	0.11	0.31	0	5.08	1.66	**6.74**
Professionals	14.95	5.92	1.31	0.05	0.15	0	16.41	5.98	**22.39**
Technicians And Associate Professionals	28.26	8.18	0.05	0	0.05	0	28.37	8.18	**36.55**
Secretarial, Clerical Services And Related Workers	3.85	3.83	0	0	0.01	0	3.87	3.83	**7.7**
Skilled Farm, Fishery, Wildlife And Related Workers	3.64	2.12	0	0	0	0	3.64	2.12	**5.76**
Craft and Related Trade Workers	0.08	0.03	0	0	0	0	0.08	0.03	**0.11**
Plant And Machine Operators And Assemblers	14.3	1.65	0.08	0	0.03	0	14.4	1.65	**16.05**
Elementary Occupations	0.42	0.05	0	0	0	0	0.42	0.05	**0.47**
Occupations Not Elsewhere Classified	2.78	1.29	0.08	0.08	0	0	2.86	1.38	**4.24**
Total	**72.23**	**24.63**	**2.34**	**0.25**	**0.56**	**0**	**75.13**	**24.87**	**100**

2.3.3 Employees by Minor Occupational Groups, Citizenship and Sex.

Table 3 presents the distribution of employees by minor occupational groups, citizenship and sex. In terms of the top five Minor occupation groups Mechanical engineering technicians had the most number of employees out of which 14 percent were male and 3 percent female. Business and public service middle level personnel was second, out of which 5 percent were male and 4 percent female. Motor vehicle drivers and power generating plant operators tied at position three while Electrical engineering technicians were in position four with male accounting for 4 percent and female 1 percent. Accountants, auditors and tax assessors minor group together with well drillers and bores was in position five. In all these minor groups, Male were very dominant.

Table 3: Distribution of Top Five Minor occupations by Citizenship and sex

Minor Occupational Group	Citizenship and Sex								Grand Total
	Kenyan		EAC		Others		Total		
	Male	Female	Male	Female	Male	Female	Male	Female	
Mechanical Engineering Technicians	14.1	2.27	0	0	0.01	0	14.12	2.27	**16**
Business And Public Service Middle Level Personnel	4.37	3.35	0	0	0.01	0	4.38	3.35	**8**
Motor Vehicle Drivers	5.46	0.99	0	0	0	0	5.46	0.99	**6**
Power Generating Plant Operators	5.27	0.45	0	0	0	0	5.27	0.45	**6**
Electrical Engineering Technicians	4.18	0.56	0	0	0.03	0	4.21	0.56	**5**
Accountants, Auditors and Tax Assessors	2.3	1.27	0.25	0.05	0.05	0	2.6	1.32	**4**
Well Drillers and Borers	3.47	0.16	0.08	0	0.03	0	3.58	0.16	4

2.3.4 Top five Minor Occupational Groups in employment in energy sector

Figure 4 illustrates the top five Employees by Minor Occupational Groups in the Energy Sector.

The top five Minor occupational groups in terms of employment numbers in the energy sector were Mechanical engineering technicians accounting for 16 percent followed by Business and public service middle level personnel at 8 percent. Motor vehicle drives Minor Group was third accounting for 7 percent followed by power generating plant operators and Electrical engineering Technicians accounting for 6 percent and 5 percent respectively.

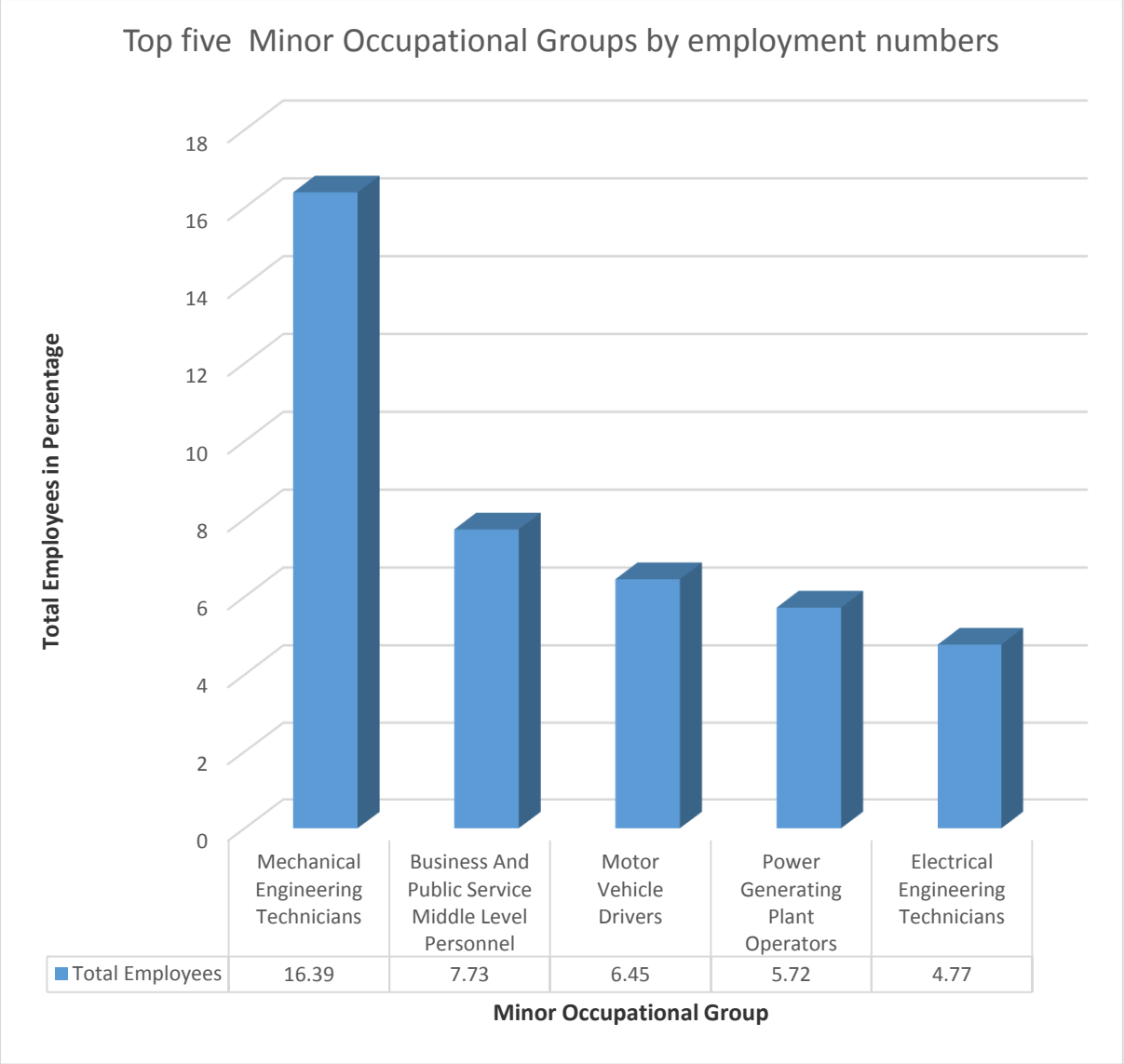


Figure 4: Employees by Minor Occupational Groups

Table 4 shows distribution of the least five Minor Occupational Groups by citizenship and sex. The least five Minor Occupational Groups accounted for less than 1 percent each.

Table 4: Distribution of Least Five Minor Occupational Groups by citizenship and sex

Minor Occupational Group	Citizenship and Sex								Grand Total
	Kenyan		EAC		Others		Total		
	Male	Female	Male	Female	Male	Female	Male	Female	
Medical/Clinical Officers	0.05	0.01	0	0	0	0	0.05	0.01	**0.07**
Technical Draughtsman	0.04	0.03	0	0	0	0	0.04	0.03	**0.07**
Business Service Agents	0.03	0	0.03	0	0	0	0.05	0	**0.05**
Production Engineers and Production Related Engineers	0.05	0	0	0	0	0	0.05	0	**0.05**
Decorators and commercial Designers	0.04	0	0	0	0	0	0.04	0	**0.04**
Welfare and Pension Officials	0.03	0.01	0	0	0	0	0.03	0.01	**0.04**
Aircraft Pilots and Related Workers	0.03	0	0	0	0	0	0.03	0	**0.03**
Legal and Related Clerks	0.01	0.01	0	0	0	0	0.01	0.01	**0.03**
Machinery Mechanics and Fitters	0.03	0	0	0	0	0	0.03	0	**0.03**
Mining Plant Operators	0	0.03	0	0	0	0	0	0.03	**0.03**
Textile Bleaching, Dyeing And Cleaning Machine Operators	0.03	0	0	0	0	0	0.03	0	**0.03**
Architects and Town Planners	0.01	0	0	0	0	0	0.01	0	**0.01**
Cleaners, Launderers And Domestic Workers	0.01	0	0	0	0	0	0.01	0	**0.01**
Pharmaceutical Assistants	0	0.01	0	0	0	0	0	0.01	**0.01**
Safety, Health and Quality Inspectors/Controllers	0.01	0	0	0	0	0	0.01	0	**0.01**
Specialized Departmental Managers	0.01	0	0	0	0	0	0.01	0	**0.01**

2.3.5 Employees by Minor Occupational Groups, Citizenship and Sex.

In respect to Minor occupational groups, Mechanical Engineering Technicians had the highest variance between male and female employees at 12 percent followed by Motor Vehicle Drivers, Electrical engineering technicians and power generating plant Operators minor occupational groups with a variance of 5 percent each. On the other hand the variance

between female and male was highest in the **Secretaries**, Stenographers and Typists Minor Occupational Group at 1 percent as detailed **(Appendix 2).**

2.3.6 Employees by Major Occupational Groups and Skill Level

Figure 5 presents the distribution of employees by skill levels. Diploma level had the highest number of employees at 29 percent followed by Bachelors and Certificate levels at 28 and 24 percent respectively. Craft and PhD skill levels had the lowest number of employees with less than 1 percent each.

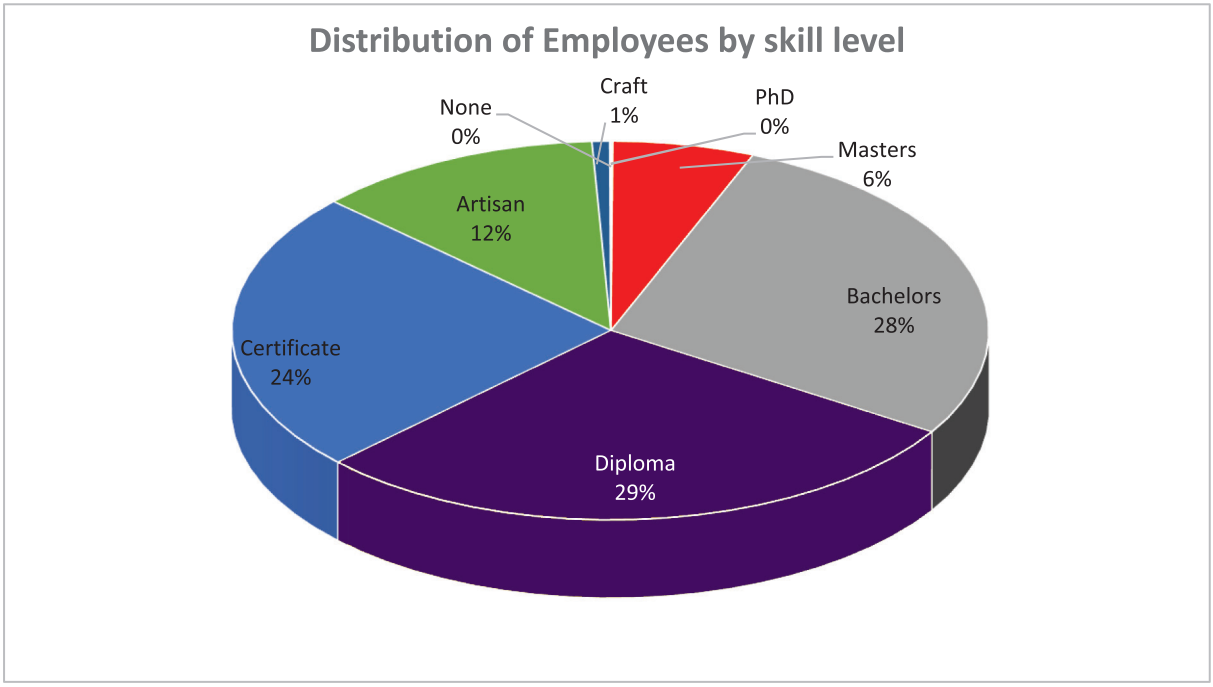
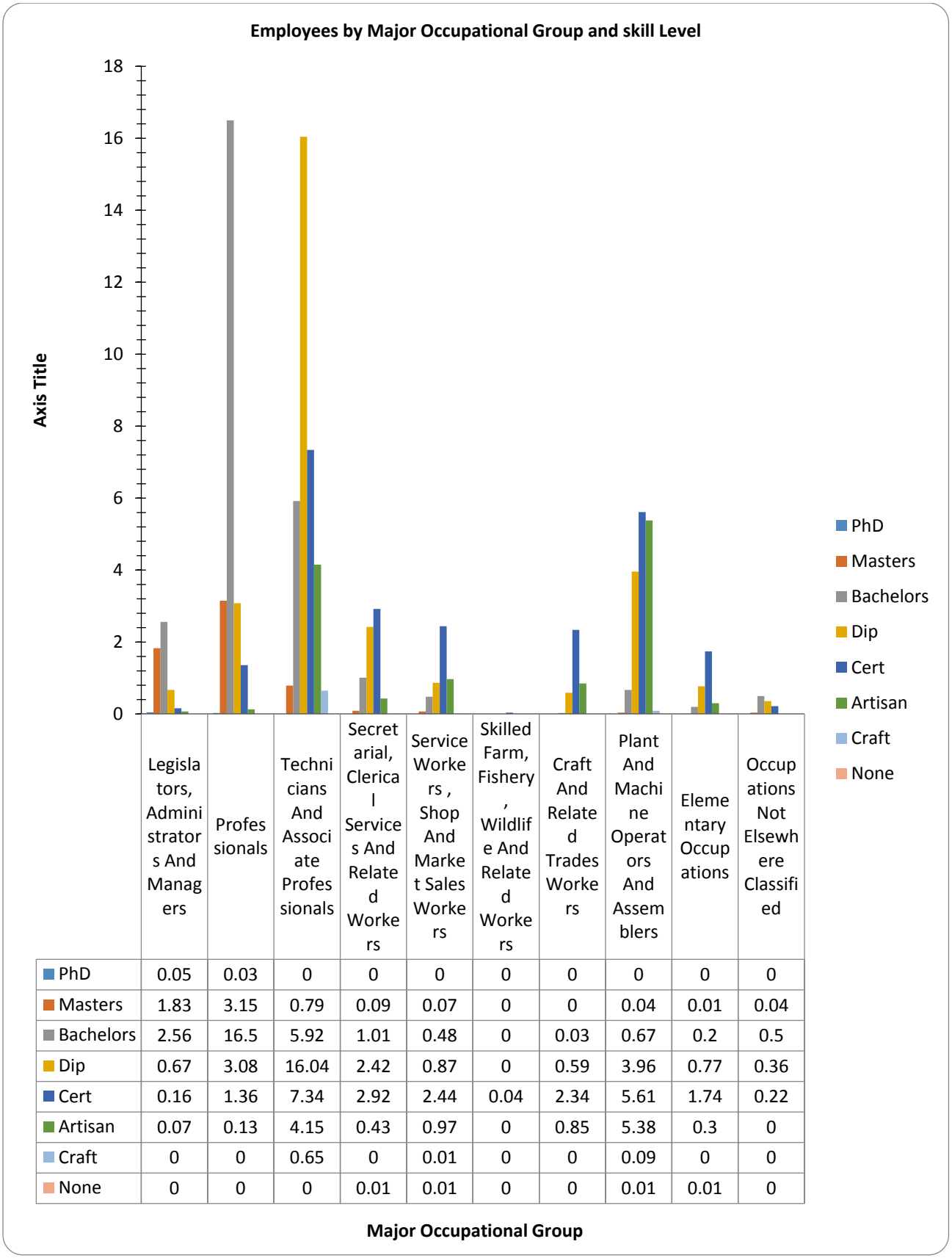


Figure 5: Distribution of Employees by skill level

In terms of Skill levels by Major Occupational Group, table 5 shows that Technicians and Associate Professionals Major Occupational Group had the highest number of employees at 35 percent followed by Professionals Major Occupational Group with 24 percent and Plant and Machine Operators and Assemblers at 16 percent. Skilled Farm, Fishery, Wildlife and Related Workers Major Occupational Group had the lowest number of employees with less than 1 percent.

Table 5: Distribution of Employees by Major occupational Groups and Skill Level by percentage

Major Occupational Group	Skill Level								Total (%)
	PhD	**Masters**	**Bachelors**	**Dip**	**Cert**	**Artisan**	**Craft**	**None**	
Legislators, Administrators And Managers	0.05	1.83	2.56	0.67	0.16	0.07	0.00	0.00	5.34
Professionals	0.03	3.15	16.50	3.08	1.36	0.13	0.00	0.00	24.25
Technicians And Associate Professionals	0.00	0.79	5.92	16.04	7.34	4.15	0.65	0.00	34.89
Secretarial, Clerical Services And Related Workers	0.00	0.09	1.01	2.42	2.92	0.43	0.00	0.01	6.89
Service Workers , Shop And Market Sales Workers	0.00	0.07	0.48	0.87	2.44	0.97	0.01	0.01	4.86
Skilled Farm, Fishery, Wildlife And Related Workers	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.04
Craft And Related Trades Workers	0.00	0.00	0.03	0.59	2.34	0.85	0.00	0.00	3.81
Plant And Machine Operators And Assemblers	0.00	0.04	0.67	3.96	5.61	5.38	0.09	0.01	15.77
Elementary Occupations	0.00	0.01	0.20	0.77	1.74	0.30	0.00	0.01	3.03
Occupations Not Elsewhere Classified	0.00	0.04	0.50	0.36	0.22	0.00	0.00	0.00	1.12
Grand Total	**0.08**	**6.03**	**27.87**	**28.78**	**24.16**	**12.27**	**0.75**	**0.05**	**100.00**



	Legislators, Administrators And Managers	Professionals	Technicians And Associate Professionals	Secretarial, Clerical Services And Related Workers	Service Workers , Shop And Market Sales Workers	Skilled Farm, Fishery , Wildlife And Related Workers	Craft And Related Trades Workers	Plant And Machine Operators And Assemblers	Elementary Occupations	Occupations Not Elsewhere Classified
PhD	0.05	0.03	0	0	0	0	0	0	0	0
Masters	1.83	3.15	0.79	0.09	0.07	0	0	0.04	0.01	0.04
Bachelors	2.56	16.5	5.92	1.01	0.48	0	0.03	0.67	0.2	0.5
Dip	0.67	3.08	16.04	2.42	0.87	0	0.59	3.96	0.77	0.36
Cert	0.16	1.36	7.34	2.92	2.44	0.04	2.34	5.61	1.74	0.22
Artisan	0.07	0.13	4.15	0.43	0.97	0	0.85	5.38	0.3	0
Craft	0	0	0.65	0	0.01	0	0	0.09	0	0
None	0	0	0	0.01	0.01	0	0	0.01	0.01	0

Figure 6: Distribution of Employees by Major occupational Groups and Skill Level

2.3.7 Technical Employees by Minor Occupational Group, Citizenship and Sex in percentage

The figure 7 provides the distribution of Technical* employees by Minor Occupational Group, and sex in percentages. The sex variance was highest in Mechanical Engineering Technicians Minor Occupational Group where male constituted 28 and female 5 percent with a difference of 24 percent followed by Power Generating Plant Operators Minor Occupational Group with a difference of 11 and Electrical Engineering Technicians Minor Occupational Group with 8 percent in favour of male. For a detailed distribution of all Technical employees **(Appendix 3).**

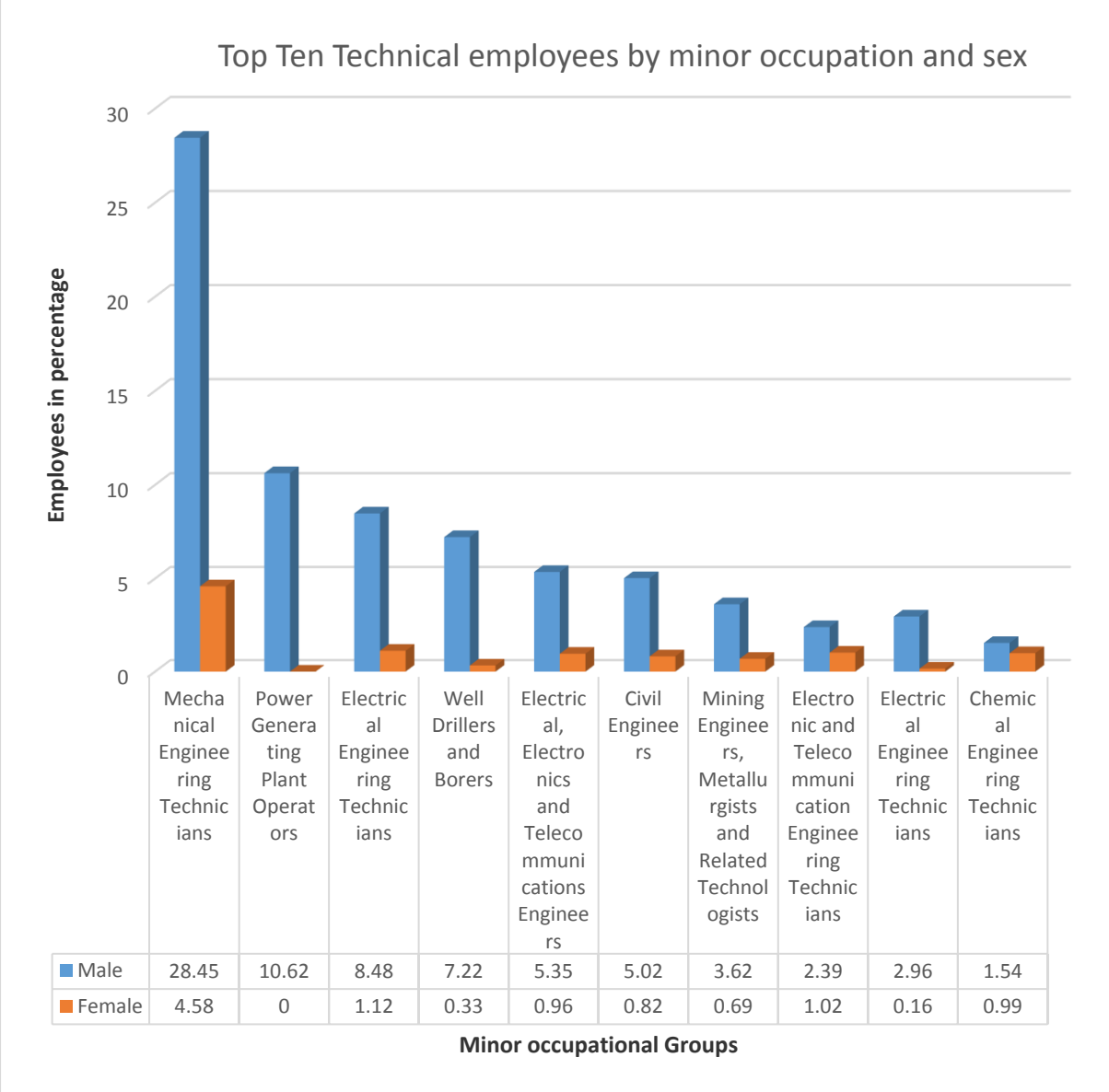


Figure 7: Top ten technical employee by minor occupation and sex

2.3.8 Non-Technical Employees by Minor Occupational Group, Citizenship and Sex in percentage

Non-Technical employees are workers who possess special and practical knowledge in support of administrative functions in the execution of the core mandate of the energy sector these include occupations like senior managers, accountants, lawyers, human resource, messengers among others. Analysis by Minor Occupational Groups shows that the Business and Public Service Middle Level Personnel were majority accounting for 16 percent, out of which males were 9 and female 8 percentage. The second Minor Occupational Group was Motor Vehicle Drivers Minor Occupational Group at 12 percent out of which, 11 percent were male workers with female accounting for 2 percent. Followed. Material recording and transport clerks was position ten as seen in figure 8.

Overall, Male employees were the majority across all the Minor Occupational Groups for non-technical employees constituting 64 percent of the employees. For detailed analysis **(Appendix 4).**

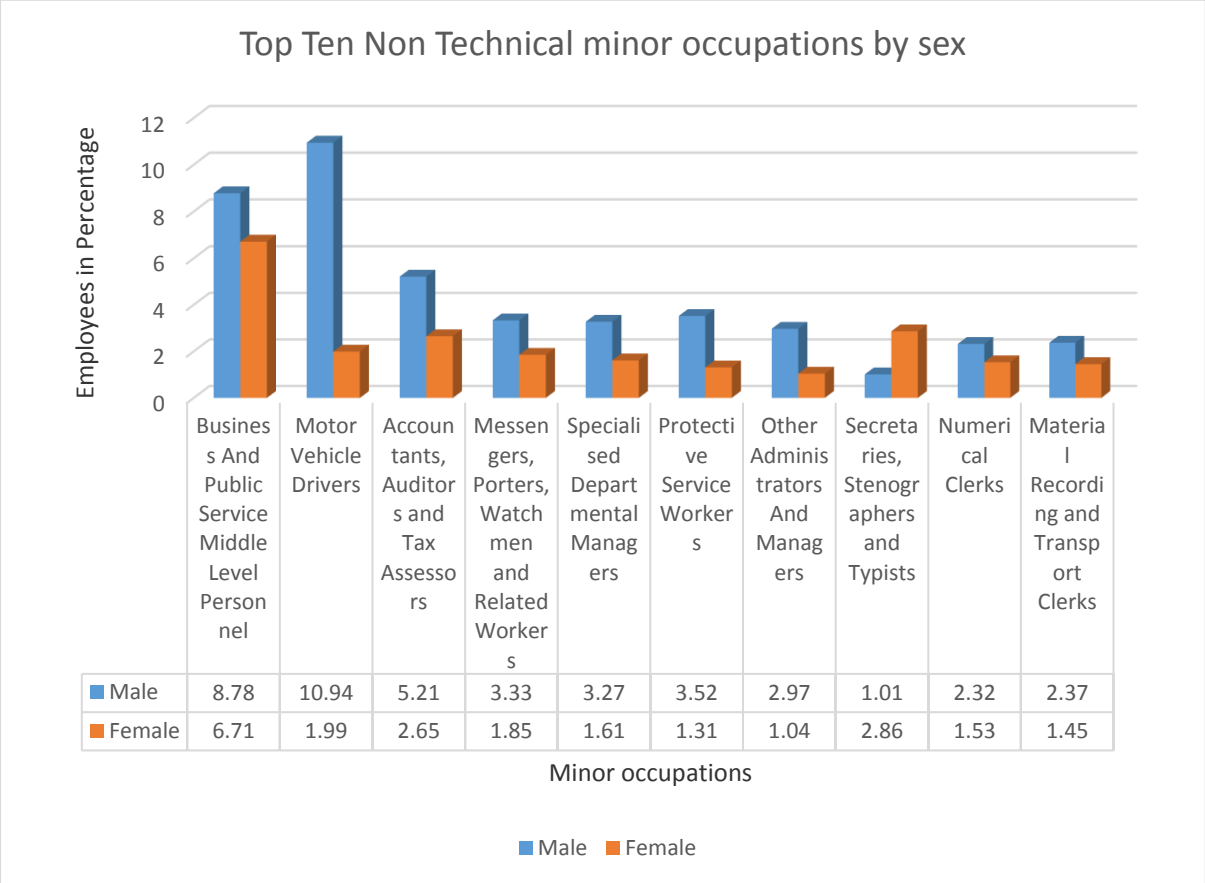


Figure 8: Top Ten Non-technical minor occupations by sex

2.3.9 Employees by Skill Area and Skill Level

This section presents the distribution of employees by Skill Area and level. The study covered 92 Skill Area and 7 categories of Skill Levels. The predominant Skill Area in the energy sector was Electrical Engineering Technology at 13 percent followed by Business and Administration at 7 percent and Accountancy, Auditing and Tax Assessment constituted 5 percent. Well Drilling and Boring and Electrical, Electronics and Telecommunications Engineers accounted 4 percent and 3 percent respectively. All other Skill Areas accounted for less than 1 percent each.

Diploma Skill Level accounted 29 percent followed by Bachelors at 28 percent and Certificate Skill level 24 percent as indicated in **(Appendix 5).**

2.3.9.1 Distribution of employees by Skill Area and Skill Level for technical staff

Table 6 presents the distribution of employees by Skill Area and Level for technical staff. Engineering and Engineering Trades Skill Area had the highest number of employees at 46 percent, out of which 25 percent had Diploma Skill Level, followed by Bachelors at 14 percent, Artisan at 3 percent. PhD, Masters, Certificate, Craft and No certificate levels had 3 percent combined.

Craft and Vocational Trade Skill Area had 36 percent out of which 22 percent had certificate Skill Level and 12 percent at Artisan Skill Level. Mathematics and Statistics Skill Area had the least number of employees at 0.3 percent.

Table 6: Distribution of Technical Employees by Skill Area and Skill Level

Skill Area	**Skill level**								
	PhD	**Masters**	**Bachelors**	**Diploma**	**Certificate**	**Artisan**	**Craft**	**No certificate**	**Total (%)**
Architecture and Building	0.00	0.14	0.89	0.62	0.02	0.00	0.00	0.00	**1.67**
Computing	0.00	0.32	3.00	1.13	1.41	0.36	0.00	0.00	**6.21**
Craft/Vocational Trades	0.00	0.00	0.12	0.87	21.97	12.27	1.09	0.02	**36.34**
Engineering and Engineering Trades	0.02	1.59	14.33	25.37	1.23	2.92	0.02	0.00	**45.47**
Environmental Protection	0.02	0.32	1.21	0.32	0.00	0.24	0.00	0.00	**2.10**
Health	0.00	0.14	0.52	0.44	0.36	0.00	0.00	0.00	**1.45**
Life Sciences	0.00	0.02	0.18	0.73	0.10	0.00	0.00	0.00	**1.03**
Manufacturing and Processing	0.00	0.00	0.10	0.48	0.81	0.69	0.00	0.04	**2.12**
Mathematics and Statistics	0.00	0.06	0.20	0.04	0.00	0.00	0.00	0.00	**0.30**
Physical Sciences	0.04	0.34	1.93	0.81	0.14	0.04	0.00	0.00	**3.29**
Total	**0.08**	**2.92**	**22.47**	**30.81**	**26.04**	**16.51**	**1.11**	**0.06**	**100.00**

2.3.9.2 Distribution of Employees by Skill Area and Level for Non-technical staff

Table 7 indicates the distribution of employees by Skill Area and Level for non-technical staff. Business and Administration Skill Area had the highest number of employees at 81 percent, out of which 31 percent had Bachelors Skill Level, followed by Diploma at 21percent and Certificate at 15 percent. PhD, Masters, Craft and No certificate levels combined had 14 percent.

Agriculture, Forestry and Fishery, Transport Services and Elementary Skill Areas registered less than 1 percent each.

Table 7: Distribution of Non- Technical* Employees by Skill Area and Level

Skill Area	**Skill Level**								
	PhD	**Masters**	**Bachelors**	**Diploma**	**Certificate**	**Artisan**	**Craft**	**No certificate**	**Total (%)**
Agriculture, Forestry and Fishery	0.0	0.0	0.2	0.0	0.1	0.0	0.0	0.0	**0.3**
Arts	0.0	0.1	1.1	0.1	0.0	0.0	0.0	0.0	**1.3**
Business and Administration	0.1	10.1	30.6	21.2	15.1	3.3	0.0	0.0	**80.5**
Certificate Not Elsewhere Classified	0.0	0.1	0.2	0.0	0.4	0.0	0.0	0.0	**0.8**
Education	0.0	0.1	0.3	0.3	0.4	0.0	0.0	0.0	**1.1**
Humanities	0.0	0.6	1.4	0.6	0.1	0.0	0.0	0.0	**2.7**
Journalism and Information	0.0	0.4	0.8	0.3	0.0	0.0	0.0	0.0	**1.4**
Law	0.0	0.3	1.5	0.5	0.2	0.0	0.0	0.0	**2.6**
Security Services	0.0	0.3	1.1	0.9	3.8	0.0	0.0	0.0	**6.1**
Social Sciences	0.0	0.5	1.8	0.3	0.0	0.0	0.0	0.0	**2.7**
Transport Services	0.0	0.1	0.1	0.3	0.1	0.0	0.0	0.0	**0.5**
Total	**0.1**	**12.6**	**39.3**	**24.5**	**20.2**	**3.3**	**0.0**	**0.0**	**100.0**

** **Non-Technical employees:** These are workers who possess special and practical knowledge in support of administrative functions in the execution of the core mandate of the energy sector e.g. accountants, lawyers, human resource, messengers among others*

2.3.10 Vacancies in the energy sector

This section presents vacancies in the energy sector by nature of Establishment, Skill Area, reasons for vacancies, nature of difficulties faced in meeting demand for skilled workers and measures taken to address the difficulties identified.

2.3.10.1 Vacancies by Skill Area

Table 8 and figure 9 provides the distribution of vacancies by skill area in the energy sector. In the technical skill Area, the highest numbers of vacancies were in Engineering and Engineering Trades at 40 percent followed by Physical Sciences at 8 percent while

Craft/Vocational Trades and Environmental Protection had the least number of vacancies at 0.3 percent each.

In the non-technical skill Area, the highest numbers of vacancies were observed in Business Administration at 20 percent followed by humanities and social sciences at 7 and 6 percent respectively. The least number of vacancies were recorded in Journalism and Information at 1 per cent and Basic General Programmes at 0.7 percent.

Table 8: Distribution of Vacancies by Skill Area

Technical Skill Area	
Skill Area	**Vacancies (%)**
Architecture and Building	5.2
Craft/Vocational Trades	0.3
Engineering and Engineering Trades	40.3
Environmental Protection	0.3
Physical Sciences	8.0
Sub-total	**54.1**
Non-Technical Skill Area	
Skill Area	**Vacancies (%)**
Business and Administration	19.5
Course Not Elsewhere Classified	0.3
Basic General Programmes	0.7
Health	3.5
Humanities	7.3
Journalism and Information	1.0
Law	4.9
Security Services	2.8
Social Sciences	5.9
Sub-total	**45.9**
Total	**100**

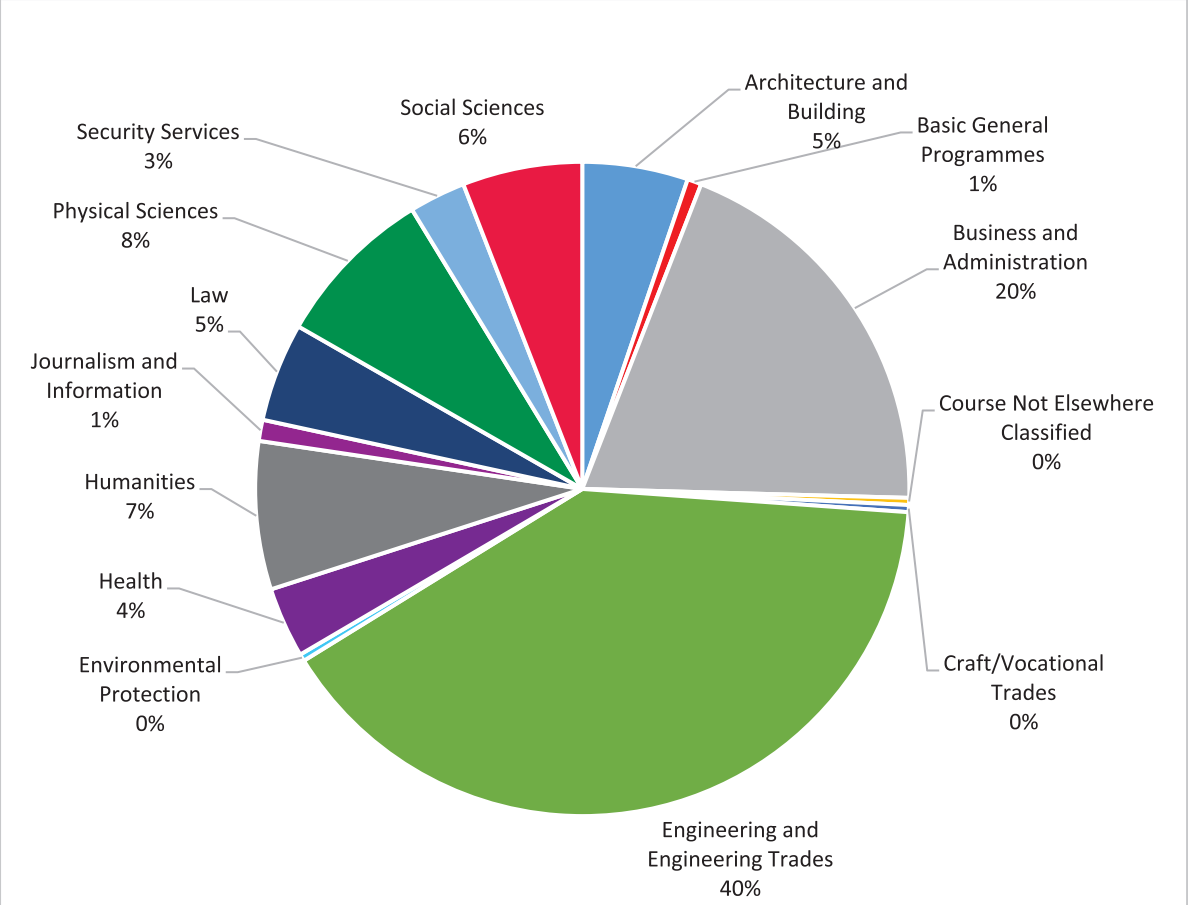


Figure 9: Vacancies by Skill Area

2.3.10.2 Vacancies by Nature of Establishment

Figure 10 presents distribution of vacancies by nature of establishment. Transportation had the highest number of vacancies at 53 percent, followed by Transmission at 28 percent. Extraction and Generation sub-sectors had 10 and 7 percent respectively while exploration had the least vacancies at 2 percent.

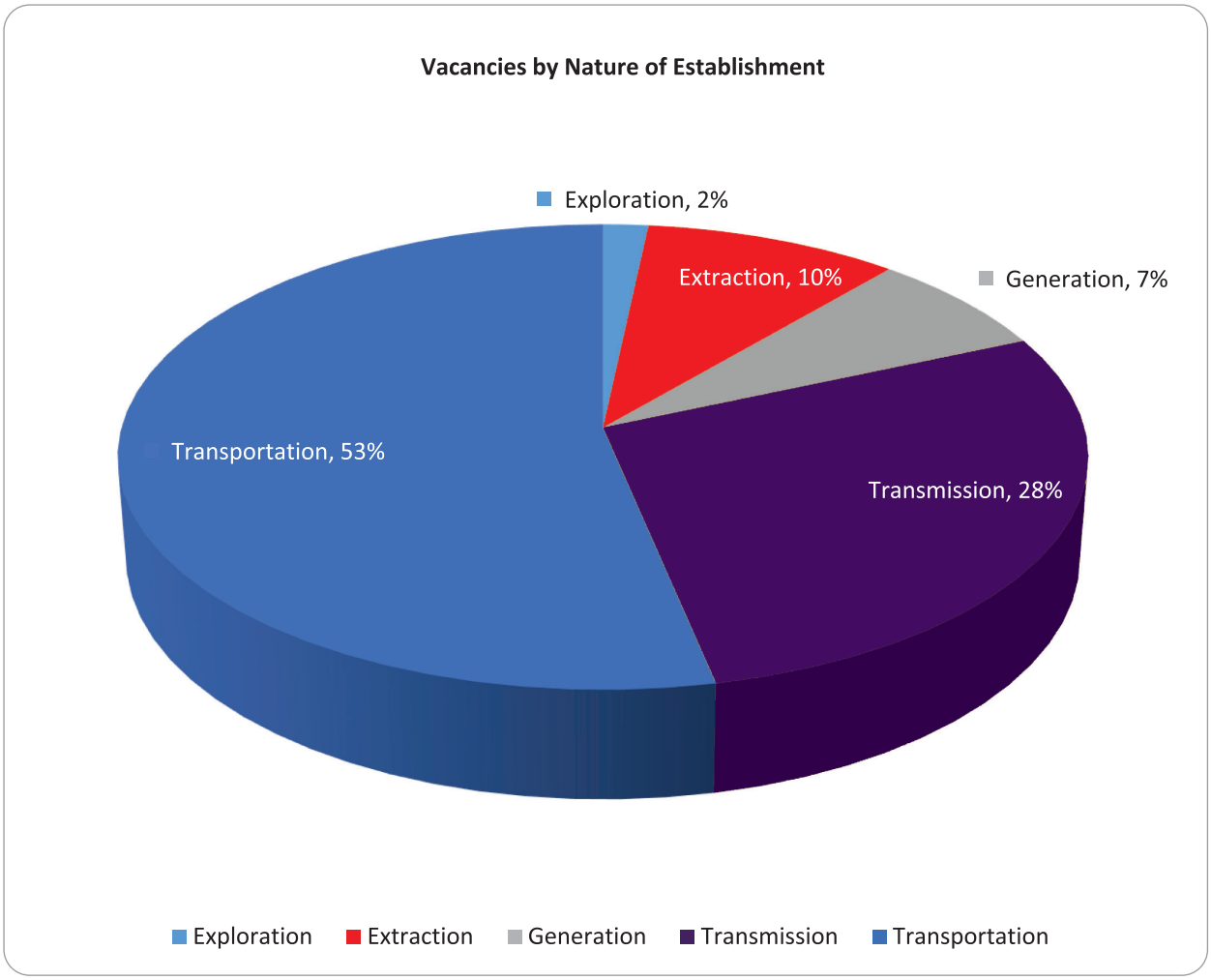


Figure 10: Distribution of vacancies by nature of establishment

2.3.10.3 Reasons for Vacancies

Table 9 depicts the reasons for vacancies. The most cited reason for existence of a vacancy was revised structure implementation at 53 percent followed by lack of budgetary allocation for recruitment at 24 percent. The least cited reasons for vacancies were: decline of offer, end of contract, lack of qualified personnel, left for greener pastures, and promotion at 0.3 percent each.

Table 9: Reasons for vacancies

Reason	**Percentage**
Business growth	1.0
Decline of Offer	0.3
Demise	1.0
End of Contract	0.3
growth needs	0.7
Lack of qualified personnel	0.3
Left for green pastures	0.3
New position	2.1
Lack of budget allocation	23.5
Normal retirement	3.5
Organization still new	1.7
Promotion	0.3
Revised Structure Implementation	52.6
Replacement	1.7
Resignation	8.0
Station not busy	1.7
Dismissal	0.3
Transfer	0.3
Total	**100.0**

2.3.11 Difficulties faced in meeting demand for skilled personnel.

This section presents the difficulties faced in meeting demand for skilled workers and measures taken to address the difficulties.

2.3.11.1 Difficulties faced in meeting demand for skilled workers

Table 10 and figure 11 shows a summary of the difficulties faced in meeting demands for skilled workers. The most cited difficulty in meeting the demand for skilled workers was graduates lacking practical skills at 32 percent followed by unavailability of trained workers at 27 percent and unfavourable climatic conditions at 18 percent. Inability to pay was the least cited difficulty at 9 percent.

Table 10: Distribution of Nature of difficulties faced in meeting demands for skilled workers

Difficulty	Percentage
Graduates Lacking Practical skills	31.8
High Labour Turnover	13.6
Inability to Pay	9.1
Unavailability of trained staff	27.3
Unfavorable climatic conditions	18.2
Total	100

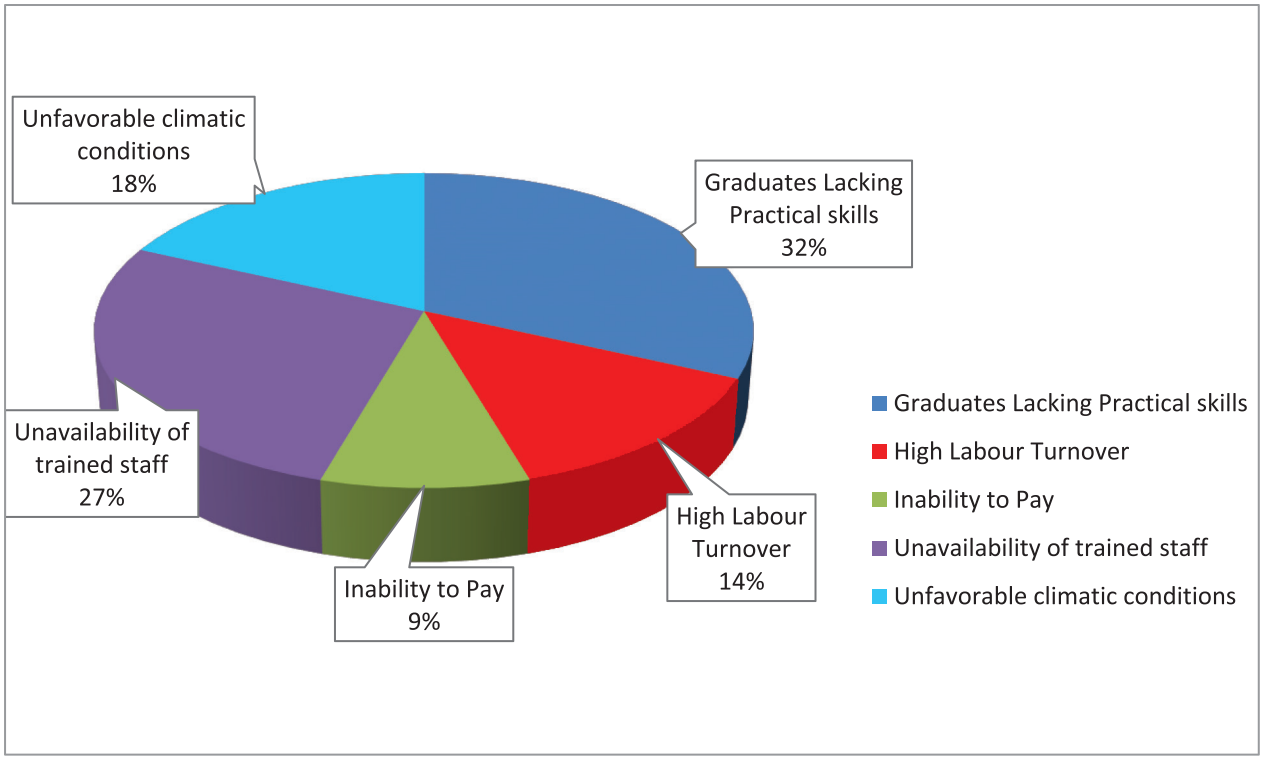


Figure 11: Distribution of Nature of difficulties faced in meeting demand for skilled workers.

2.3.11.2 Measures taken to Address Difficulties

Table 11 and figure 12 describes measures taken to address difficulties faced in meeting demand for skilled workers. The most commonly used measure of addressing identified difficulties was mentorship programmes at 17 percent while the least used measures were internship and incentives at less than 1 percent each.

Table 11: Measure taken to address the Difficulties

MEASURE	PERCENTAGE
Mentorship programme	17.4
On the job training	8.7
Induction	8.7
In house training	8.7
Partnering with TVET institutions in training	8.7
Seeking Government funding	8.7
Refresher course	8.7
Apprentice programme	4.4
Head hunting	4.4
Recruitment	4.4
Industrial attachment	4.4
Growing business	4.4
safety measures	4.4
Training local and oversees	4.4
Internship	-
Incentives	-

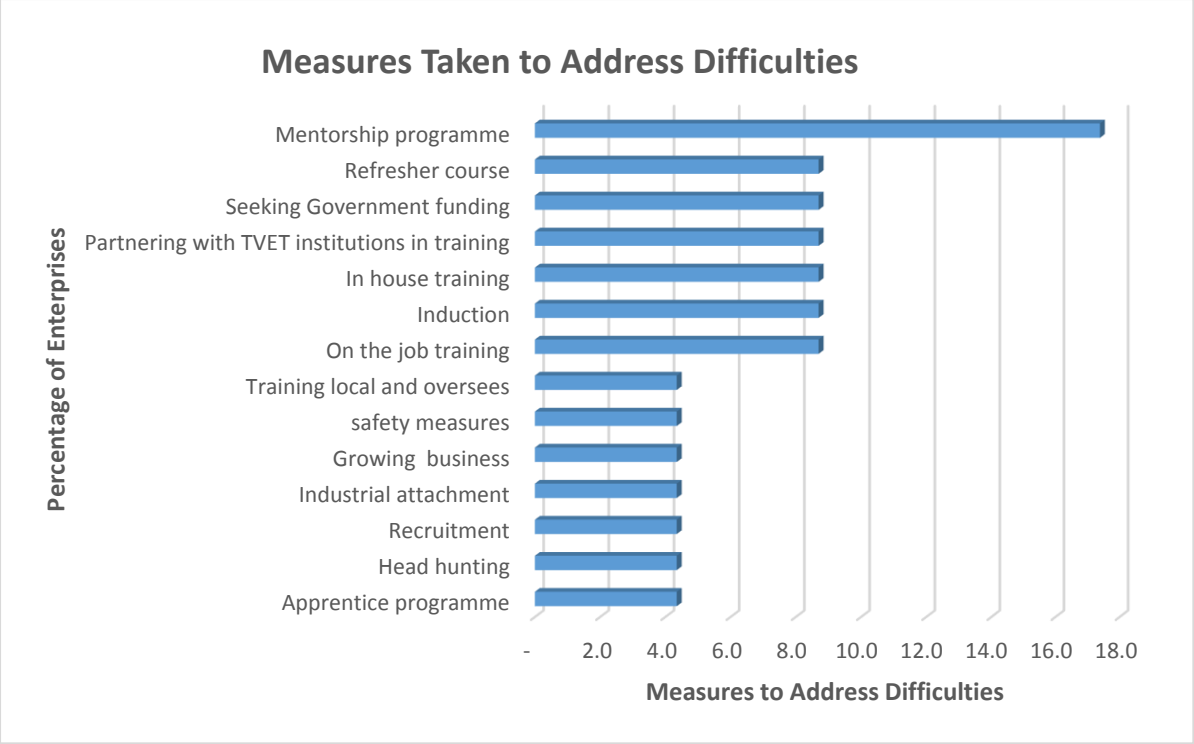


Figure 12: Measures taken to address the Difficulties

2.3.12 Future Skill Area requirements by Skill Level

Table 12 and Figure 7 provide future Skill Levels and Skill Area requirements in the energy sector. Engineering and Engineering Trades, Physical Sciences and Business and Administration were the most popular Skill Areas required by the establishments in the future, accounting for 10 percent each. Computing and Security Skill Areas also had significant future skill demands, constituting 8 percent each. Transport Services, Social Services, Personal Services, Personal Development, Mathematics and Statistics, Journalism and Information Skill Areas were the least required by the establishments at 2 percent each**.**

Table 12: Future Skill Area Requirements

Main Skill Area	**Percentage of Skill Area**
Business and Administration	10
Engineering and Engineering Trades	10
Physical Sciences	10
Computing	8
Security Services	8
Craft/Vocational Trades	6
Environmental Protection	6
Health	6
Social Sciences	6
Architecture and Building	4
Arts	4
Certificate Not Elsewhere Classified	4
Education	4
Law	4
Journalism and Information	2
Mathematics and Statistics	2
Personal Development	2
Personal Services	2
Social Services	2
Transport Services	2
Total Percentage	**100**

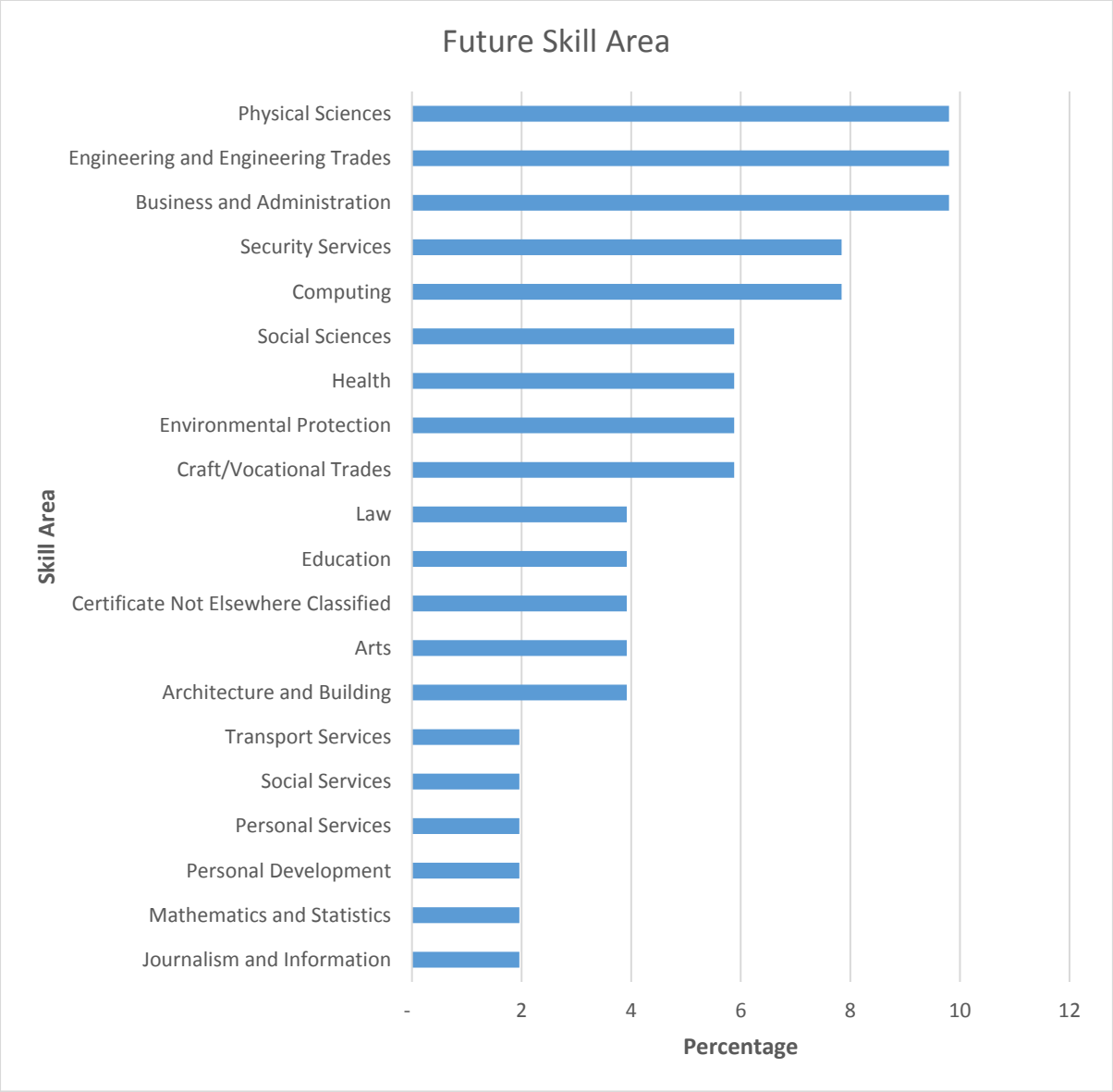


Figure 13: Future Skill Area Requirements

Table 13 and Figure 14 indicates that majority of the establishments preferred future workers to have Diploma level of training accounting for 29 percent followed by Artisan Skill Level at 22 percent. It further reveals that most establishments would not require workers with Skills at the PhD level in the future.

Table 13: Future Skill Level Requirements

Main Skill Level	Percentage of Skill Level
Masters	13.72
Bachelors	15.68
Diploma	29.41
Certificate	19.60
Artisan	21.68
Total	**100**

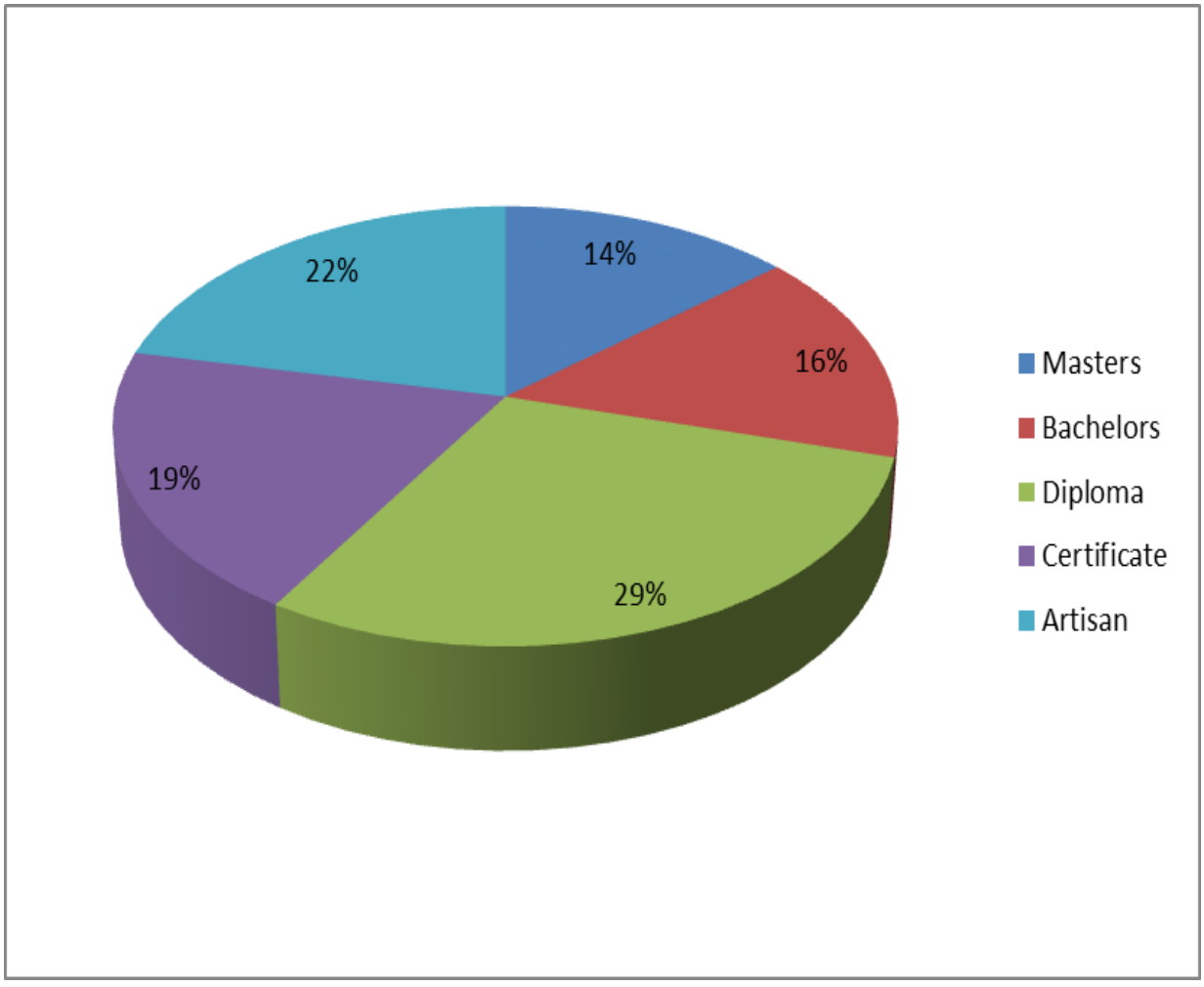


Figure 14: Future Skill Level Requirements

CHAPTER THREE: FINDINGS

3.0 Introduction

This chapter presents the findings of the survey covering types and level of skills, skills demand and gaps as well as future skills requirements in the energy sector.

3.1 Findings

The findings of the study were:-

- Technicians and Associate Professionals Major Occupational Group had the highest number of employees followed by Professionals' Major Occupational group. Generation sub-sector activity had the highest number of employees followed by Transportation and Transmission sub-sectors.
- Overall, male employees constituted 75 percent of all employees.
- Male employees constituted the majority of the employees' at both Major Occupational Groups and Minor Occupational Groups with the highest disparity in Technicians and Associate Professionals and; Mechanical Engineering Technicians respectively. Female were highest in Business and Public Service Middle level personnel.
- Major Occupational Groups in professionals and Legislators, Administrators and Managers had a significant number of employees from East African countries and other nationals.
- There were a total of 92 Skill Areas and 7 categories of Skill Levels.
- The predominant Skill Area in the energy sector was Electrical Engineering followed by Business and Administration.
- Among the technical employees, Engineering and Engineering Trades Skill Area had the highest number of employees followed by Craft and Vocational Trade Skill Area. Diploma Skill Level had the highest number of employees followed by Bachelors Skill Level and Certificate Skill Level.

- Among the non -technical employees, Business and Administration Skill Area had the highest number of employees with Bachelors and Diploma Skill Level having the highest number of employees.
- The highest number of vacancies within the technical Skill Area was in Engineering and Engineering Trades, Physical Sciences, and Architecture and Building.
- In non-technical Skill Area, Business and Administration had the highest number of vacancies followed by Humanities and Social Sciences.
- Transportation sub-sector had the highest number of vacancies at 53 percent followed by Transmission sub-sector at 28 percent
- The most cited reason for the existence of vacancies was implementation of revised organisational structures, followed by lack of budgetary allocation for recruitment while the least cited reasons for vacancies were; decline of offer of employment, end of contract, lack of qualified personnel, greener pastures, dismissal, transfers and promotion .
- The most cited difficulty in meeting the demand for skilled workers was graduates lacking practical skills followed by unavailability of trained workers and unfavourable climatic conditions.
- The most commonly used measure of addressing identified difficulties was mentorship programmes.
- Majority of establishments preferred future workers with Diploma level of training followed by Artisan Skill Level, while most establishments indicated that they would not require workers at PhD skill level.
- Engineering and Engineering Trades, Physical Sciences and; Business and Administration, were the preferred future Skill Areas in the energy sector.
- In the occupational categories, there were job titles which could not match with the ones classified in the Kenya National Occupations Classification Standard (KNOCS 2000) thus impeding greatly on the occupational coding.

CHAPTER FOUR:

CONCLUSIONS AND RECOMMENDATIONS

4.0 Introduction

This chapter presents conclusions and recommendations of the survey.

4.1 Conclusions

i. Employees with middle level skills such as Diploma and Artisans are the most preferred in the energy sector.

ii. Employees with PhD and Masters Skill Levels are not prevalent in the energy sector.

iii. The sector has shortages in critical skill areas in Engineering and Engineering trades as well as in Physical Sciences, Architecture and Building.

4.2 Recommendations

i. The government should create more awareness and increase funding for students joining Technical, Vocational Education and Training (TVET) institutions, Middle level Colleges and Universities to pursue courses related to Engineering and Engineering trades and Physical Sciences. In addition, establishment of TVET institutions in every county would probably increase the uptake of craft courses for students who may wish to discontinue their studies any level.

ii. The Kenya National Occupation Classification Standard was used in classification and categorization of occupations. However, a number of occupations could not be effectively placed which calls for further research to establish if they are emerging /new occupations in the energy sector or a change of title.

iii. An affirmative action should be taken to encourage female students to venture into technical related trainings through scholarships so as to reduce sex disparity in the Energy Sector.

iv. There is in need to strength the linkages between industry and training institutions in order to identify skills mismatch and future skills requirements in the labour market with a view of reviewing curriculum to accommodate emerging occupations.

v. A memorandum of understanding between the energy sector establishments and the training institutions should be put in place to facilitate graduates in gaining practical experience through attachments, internships, and apprenticeship opportunities. In addition, knowledge, skills and competences may be enhanced through a deliberate effort to increase industry interaction hour's verses classroom hours. In the long term graduates released to the labour market would have minimum experience required by the industry.

vi. There is need to carry out further research to establish why there is lack of skills at craft level which ordinarily is expected to be among the skills driving the energy sector.

4.3 Implementation Matrix

S/NO	Project/Activity	Objective	Expected Output/Outcome	Indicator	Implementing Agency	Time Frame
1	Promote TVET	-To increase employability of graduates -To increase number of people with technical skills at middle and lower levels -Increase number of job creators	Increased number of people with technical skills at middle and lower levels	Reduced technical skills shortages at middle and lower levels	ML&SP, MOEST	Continuous
2	Occupational research	-To determine emerging and new occupations	Revised KNOCs	Revised KNOCs	MOL&SP	2020
3	Promote STEM for females	-To increase number of female enrolled in STEM	Increased female enrollment	No of enrolled females	MOEST	Continuous
4	Promote Linkages between Training Institutions and Industry	-To reduce skill mismatch -To determine future skills requirement -To give graduate practical experience through attachment, internship etc.	-Increased productivity of employees - Enhanced employability of graduates	-Less unemployment of graduates	MOL&SP, MOEST, FKE, COTU	Continuous
5	Further survey in energy sector	-To capture skills in renewable energy sub-sector -To capture skills in downstream section	More skill profile in the energy sector	Skill inventory in the energy sector	ML&SP	2021

APPENDICES

Appendix 1: Distribution of Employees by Major Occupational Groups and sub-sector activity category.

Major Occupational Group	Sub-Sector Activity					Total (%)
	Distribution	Generation	Regulation	Transmission	Transportation	
Legislators, Administrators and Managers	0.01	2.53	0.13	1.06	1.6	5.34
Professionals	0.08	12.58	0.35	4.67	6.57	24.25
Technicians and Associate Professionals	0.42	16.26	0.23	7.73	10.26	34.89
Secretarial, Clerical Services And Related Workers	0	2.07	0.09	1.97	2.76	6.89
Service Workers , Shop and Market Sales Workers	0	2.34	0	0.32	2.19	4.86
Skilled Farm, Fishery, Wildlife And Related Workers	0	0.04	0	0	0	0.04
Craft and Related Trades Workers	0.32	3.45	0	0.01	0.03	3.81
Plant and Machine Operators And Assemblers	0	11.88	0	2.88	1.01	15.77
Elementary Occupations	0	0.74	0	0	2.29	3.03
Occupations Not Elsewhere Classified	0	0.13	0	0.66	0.32	1.12
Grand Total	**0.83**	**52.03**	**0.81**	**19.3**	**27.03**	**100**

Appendix 2: Employees by Minor Occupational Groups, Citizenship and Sex

Minor Occupational Groups	Kenyan		EAC		Others		Total		
	Male	Female	Male	Female	Male	Female	Male	Female	Variance
Mechanical Engineering Technicians	14.1	2.27	0	0	0.01	0	14.12	2.27	11.9
Electrical Engineering Technicians	5.65	0.64	0	0	0.03	0	5.68	0.64	5.0
Power Generating Plant Operators	5.27	0.45	0	0	0	0	5.27	0.45	4.8
Motor Vehicle Drivers	5.46	0.99	0	0	0	0	5.46	0.99	4.5
Well Drillers and Borers	3.47	0.16	0.08	0	0.03	0	3.58	0.16	3.4
Electrical, Electronics and Telecommunications Engineers	2.65	0.48	0	0	0	0	2.65	0.48	2.2
Civil Engineers	2.11	0.41	0.35	0	0.03	0	2.49	0.41	2.1
Mining Engineers, Metallurgists and Related Technologists	1.8	0.34	0	0	0	0	1.8	0.34	1.5
Accountants, Auditors and Tax Assessors	2.3	1.27	0.25	0.05	0.05	0	2.6	1.32	1.3
Protective Service Workers	1.76	0.65	0	0	0	0	1.76	0.65	1.1
Civil Engineering and Related Technicians	1.1	0.07	0	0	0	0	1.1	0.07	1.0
Business And Public Service Middle Level Personnel	4.37	3.35	0	0	0.01	0	4.38	3.35	1.0
Other Administrators And Managers	1.44	0.52	0.03	0	0.01	0	1.48	0.52	1.0
Non-Departmental Managers	0.78	0.15	0.14	0.05	0.22	0	1.13	0.2	0.9
Specialised Departmental Managers	1.15	0.75	0.41	0.05	0.08	0	1.64	0.8	0.8
Messengers, Porters, Watchmen and Related Workers	1.66	0.93	0	0	0	0	1.66	0.93	0.7
Electronic and Telecommunication Engineering Technicians	1.18	0.5	0	0	0	0	1.18	0.5	0.7
Metal Moulders, Welders, Structural-Metal Preparers and Related Trades Workers	0.69	0.01	0	0	0	0	0.69	0.01	0.7
Other Social Science and Related Professionals	0.34	0.07	0.35	0	0	0	0.69	0.07	0.6
Chemical Engineers and Technologists	0.48	0.07	0.08	0	0	0	0.56	0.07	0.5
Personnel And Occupational Professionals	0.99	0.57	0.05	0	0	0	1.05	0.57	0.5
Material Recording and Transport Clerks	1.18	0.72	0	0	0	0	1.18	0.72	0.5
Computing Professionals	0.59	0.16	0.03	0	0	0	0.61	0.16	0.5

Minor Occupational Groups	Kenyan		EAC		Others		Total		
	Male	Female	Male	Female	Male	Female	Male	Female	Variance
Physicists And Related Professionals	0.71	0.34	0.03	0	0	0	0.74	0.34	0.4
Numerical Clerks	1.16	0.76	0	0	0	0	1.16	0.76	0.4
Other Middle Level Personnel	0.52	0.23	0.05	0	0	0	0.57	0.23	0.3
Construction And Maintenance Labourers	0.33	0	0	0	0	0	0.33	0	0.3
Other Departmental Managers	0.26	0.03	0.08	0	0	0	0.34	0.03	0.3
Surveyors and Cartographers	0.3	0.04	0.03	0	0	0	0.33	0.04	0.3
Minor Groups Not Elsewhere Classified	0.57	0.29	0	0	0	0	0.57	0.29	0.3
Chemical Engineering Technicians	0.76	0.49	0	0	0	0	0.76	0.49	0.3
Lawyers	0.33	0.15	0.08	0	0	0	0.41	0.15	0.3
Mechanical Engineers	0.26	0.11	0.03	0	0.05	0	0.34	0.11	0.2
Chemists	0.25	0.12	0	0	0	0	0.25	0.12	0.1
Life Science Professionals	0.27	0.14	0	0	0	0	0.27	0.14	0.1
Directors And Chief Executives	0.11	0.03	0.03	0	0	0	0.14	0.03	0.1
Mathematicians And Related Professionals	0.14	0.03	0	0	0	0	0.14	0.03	0.1
Senior Officials Of Special Interest Organizations	0.15	0.08	0.03	0	0	0	0.18	0.08	0.1
Life Science Technicians	0.08	0	0	0	0	0	0.08	0	0.1
House Stewards And Housekeepers	0.22	0.14	0	0	0	0	0.22	0.14	0.1
Cooks and Other Catering Service Workers	0.64	0.57	0	0	0	0	0.64	0.57	0.1
Building Trades Workers	0.08	0.01	0	0	0	0	0.08	0.01	0.1
Electrical Equipment Fitters and Installers	0.07	0	0	0	0	0	0.07	0	0.1
Information Clerks	0.23	0.16	0	0	0	0	0.23	0.16	0.1
Agricultural And Materials-Handling Machinery Operators	0.07	0.01	0	0	0	0	0.07	0.01	0.1
Archivists, Librarians and Related Professionals	0.1	0.04	0	0	0	0	0.1	0.04	0.1
Building Caretakers	0.14	0.03	0.03	0.08	0	0	0.16	0.11	0.1
Business Service Agents	0.03	0	0.03	0	0	0	0.05	0	0.1
Insurance Brokers and Agents	0.1	0.05	0	0	0	0	0.1	0.05	0.1
Production Engineers and Production Related	0.05	0	0	0	0	0	0.05	0	0.1

Minor Occupational Groups	Kenyan		EAC		Others		Total		
	Male	Female	Male	Female	Male	Female	Male	Female	Variance
Engineers									
Tax Assessor	0.03	0.03	0.05	0	0	0	0.08	0.03	0.1
Waiters and Bartenders	0.15	0.1	0	0	0	0	0.15	0.1	0.1
Physical Science Technicians	0.07	0.03	0	0	0	0	0.07	0.03	0.0
Decorators and commercial Designers	0.04	0	0	0	0	0	0.04	0	0.0
Medical/Clinical Officers	0.05	0.01	0	0	0	0	0.05	0.01	0.0
Statistical, and Planning Officials	0.08	0.04	0	0	0	0	0.08	0.04	0.0
Library, Mail and Related Clerks	0.44	0.41	0	0	0	0	0.44	0.41	0.0
Aircraft Pilots and Related Workers	0.03	0	0	0	0	0	0.03	0	0.0
Machinery Mechanics and Fitters	0.03	0	0	0	0	0	0.03	0	0.0
Psychologists	0.1	0.07	0	0	0	0	0.1	0.07	0.0
Textile Bleaching, Dyeing And Cleaning Machine Operators	0.03	0	0	0	0	0	0.03	0	0.0
General Office Clerks	0.31	0.31	0	0	0.01	0	0.33	0.31	0.0
Data Base And Network Professionals	0.05	0.03	0	0	0	0	0.05	0.03	0.0
Nursing and Mid-wifery Professionals	0.05	0.03	0	0	0	0	0.05	0.03	0.0
Welfare and Pension Officials	0.03	0.01	0	0	0	0	0.03	0.01	0.0
Technical Draughtsmen	0.04	0.03	0	0	0	0	0.04	0.03	0.0
Architects and Town Planners	0.01	0	0	0	0	0	0.01	0	0.0
Cleaners, Launderers And Domestic Workers	0.01	0	0	0	0	0	0.01	0	0.0
Safety, Health and Quality Inspectors/Controllers	0.01	0	0	0	0	0	0.01	0	0.0
Social Workers And Helpers	0.11	0.1	0	0	0	0	0.11	0.1	0.0
Legal and Related Clerks	0.01	0.01	0	0	0	0	0.01	0.01	0.0
Sociologists, Anthropologists and Related Professionals	0.04	0.04	0	0	0	0	0.04	0.04	0.0
Pharmaceutical Assistants	0	0.01	0	0	0	0	0	0.01	0.0
Economists	0.2	0.22	0	0	0	0	0.2	0.22	0.0
Mining Plant Operators	0	0.03	0	0	0	0	0	0.03	0.0

Minor Occupational Groups	Kenyan		EAC		Others		Total		
	Male	Female	Male	Female	Male	Female	Male	Female	Variance
Other Business Professionals	0.45	0.5	0	0	0	0	0.45	0.5	-0.1
Authors, Journalists and Related Professionals	0.64	0.83	0.11	0	0.01	0	0.76	0.83	-0.1
Athletes, Sportspersons And Other Related Workers	0.04	0.27	0	0	0	0	0.04	0.27	-0.2
Field Crop, Vegetable and Horticultural Farm Workers	0.22	0.71	0	0	0	0	0.22	0.71	-0.5
Secretaries, Stenographers and Typists	0.5	1.43	0	0	0	0	0.5	1.43	-0.9
Total	**72.23**	**24.63**	**2.34**	**0.25**	**0.56**	**0**	**75.13**	**24.87**	**50.3**

Appendix 3: Distribution of Technical Employees by Minor Occupational Group, Citizenship and Sex in percentage

Minor Occupational Group	Citizenship and Sex								Total (%)
	Kenyan		EAC		Others		Total		
	Male	Female	Male	Female	Male	Female	Male	Female	
Chemical Engineering Technicians	1.54	0.99	0	0	0	0	1.54	0.99	**2.52**
Chemical Engineers and Technologists	0.96	0.14	0.16	0	0	0	1.12	0.14	**1.26**
Chemists	0.49	0.25	0	0	0	0	0.49	0.25	**0.74**
Civil Engineering and Related Technicians	2.22	0.14	0	0	0	0	2.22	0.14	**2.36**
Civil Engineers	4.25	0.82	0.71	0	0.05	0	5.02	0.82	**5.84**
Computing Professionals	1.18	0.33	0.05	0	0	0	1.23	0.33	**1.56**
Construction And Maintenance Labourers	0.66	0	0	0	0	0	0.66	0	**0.66**
Electrical Engineering Technicians	2.96	0.16	0	0	0	0	2.96	0.16	**3.13**
Electrical Engineering Technicians	8.42	1.12	0	0	0.05	0	8.48	1.12	**9.6**
Electrical Equipment Fitters and Installers	0.14	0	0	0	0	0	0.14	0	**0.14**
Electrical, Electronics and Telecommunications Engineers	5.35	0.96	0	0	0	0	5.35	0.96	**6.31**
Electronic and Telecommunication Engineering Technicians	2.39	1.02	0	0	0	0	2.39	1.02	**3.4**
Life Science Professionals	0.55	0.27	0	0	0	0	0.55	0.27	**0.82**
Life Science Technicians	0.16	0	0	0	0	0	0.16	0	**0.16**
Machinery Mechanics and Fitters	0.05	0	0	0	0	0	0.05	0	**0.05**
Mechanical Engineering Technicians	28.42	4.58	0	0	0.03	0	28.45	4.58	**33.03**
Mechanical Engineers	0.52	0.22	0.05	0	0.11	0	0.69	0.22	**0.91**
Medical/Clinical Officers	0.11	0.03	0	0	0	0	0.11	0.03	**0.14**
Metal Moulders, Welders, Structural-Metal Preparers and Related Trades Workers	1.4	0.03	0	0	0	0	1.4	0.03	**1.43**
Mining Engineers, Metallurgists and Related Technologists	3.62	0.69	0	0	0	0	3.62	0.69	**4.31**
Mining Plant Operators	0	0.05	0	0	0	0	0	0.05	**0.05**
Pharmaceutical Assistants	0	0.03	0	0	0	0	0	0.03	**0.03**

Minor Occupational Group	Citizenship and Sex								Total (%)
	Kenyan		EAC		Others		Total		
	Male	Female	Male	Female	Male	Female	Male	Female	
Physical Science Technicians	0.14	0.05	0	0	0	0	0.14	0.05	**0.19**
Physicists And Related Professionals	1.43	0.69	0.05	0	0	0	1.48	0.69	**2.17**
Power Generating Plant Operators	10.62	0	0	0	0	0	10.62	0	**10.62**
Production Engineers and Production Related Engineers	0.11	0	0	0	0	0	0.11	0	**0.11**
Safety, Health and Quality Inspectors/Controllers	0.03	0	0	0	0	0	0.03	0	**0.03**
Surveyors and Cartographers	0.6	0.08	0.05	0	0	0	0.66	0.08	**0.74**
Technical Draughtsmen	0.08	0.05	0	0	0	0	0.08	0.05	**0.14**
Well Drillers and Borers	7	0.33	0.16	0	0.05	0	7.22	0.33	**7.54**
Total	**85.4**	**13.03**	**1.26**	**0**	**0.3**	**0**	**86.97**	**13.03**	**100**

**** Technical Employees**: These are workers who possess special and practical knowledge to execute the core mandate of the energy sector e.g. electrical engineers, geologists, cartographers, plant operators among others*

Appendix 4: Distribution of Non-Technical Employees by Minor Occupational Group, Citizenship and Sex in percentage

Minor Occupational Group	Citizenship and Sex								Total (%)
	Kenyan		EAC		Others		Total		
	Male	Female	Male	Female	Male	Female	Male	Female	
Accountants, Auditors and Tax Assessors	4.61	2.54	0.49	0.11	0.11	0	5.21	2.65	7.85
Agricultural And Materials-Handling Machinery Operators	0.14	0.03	0	0	0	0	0.14	0.03	0.16
Aircraft Pilots and Related Workers	0.05	0	0	0	0	0	0.05	0	0.05
Architects and Town Planners	0.03	0	0	0	0	0	0.03	0	0.03
Archivists, Librarians and Related Professionals	0.19	0.08	0	0	0	0	0.19	0.08	0.27
Athletes, Sportspersons And Other Related Workers	0.08	0.55	0	0	0	0	0.08	0.55	0.63
Authors, Journalists and Related Professionals	1.28	1.66	0.22	0	0.03	0	1.53	1.66	3.19
Building Caretakers	0.27	0.05	0.05	0.16	0	0	0.33	0.22	0.55
Building Trades Workers	0.16	0.03	0	0	0	0	0.16	0.03	0.19
Business And Public Service Middle Level Personnel	8.75	6.71	0	0	0.03	0	8.78	6.71	15.49
Business Service Agents	0.05	0	0.05	0	0	0	0.11	0	0.11
Cleaners, Launderers And Domestic Workers	0.03	0	0	0	0	0	0.03	0	0.03
Cooks and Other Catering Service Workers	1.28	1.15	0	0	0	0	1.28	1.15	2.43
Data Base And Network Professionals	0.11	0.05	0	0	0	0	0.11	0.05	0.16
Decorators and commercial Designers	0.08	0	0	0	0	0	0.08	0	0.08
Directors And Chief Executives	0.22	0.05	0.05	0	0	0	0.27	0.05	0.33
Economists	0.41	0.44	0	0	0	0	0.41	0.44	0.85
Field Crop, Vegetable and Horticultural Farm Workers	0.44	1.42	0	0	0	0	0.44	1.42	1.85
General Office Clerks	0.63	0.63	0	0	0.03	0	0.65	0.63	1.28
House Stewards And Housekeepers	0.44	0.27	0	0	0	0	0.44	0.27	0.71
Information Clerks	0.46	0.33	0	0	0	0	0.46	0.33	0.79
Insurance Brokers and Agents	0.19	0.11	0	0	0	0	0.19	0.11	0.3

Minor Occupational Group	Citizenship and Sex								Total (%)
	Kenyan		EAC		Others		Total		
	Male	Female	Male	Female	Male	Female	Male	Female	
Lawyers	0.65	0.3	0.16	0	0	0	0.82	0.3	1.12
Legal and Related Clerks	0.03	0.03	0	0	0	0	0.03	0.03	0.05
Library, Mail and Related Clerks	0.87	0.82	0	0	0	0	0.87	0.82	1.69
Material Recording and Transport Clerks	2.37	1.45	0	0	0	0	2.37	1.45	3.82
Mathematicians And Related Professionals	0.27	0.05	0	0	0	0	0.27	0.05	0.33
Messengers, Porters, Watchmen and Related Workers	3.33	1.85	0	0	0	0	3.33	1.85	5.18
Minor Groups Not Elsewhere Classified	1.15	0.57	0	0	0	0	1.15	0.57	1.72
Motor Vehicle Drivers	10.94	1.99	0	0	0	0	10.94	1.99	12.93
Non-Departmental Managers	1.55	0.3	0.27	0.11	0.44	0	2.26	0.41	2.67
Numerical Clerks	2.32	1.53	0	0	0	0	2.32	1.53	3.85
Nursing and Mid-wifery Professionals	0.11	0.05	0	0	0	0	0.11	0.05	0.16
Other Administrators And Managers	2.89	1.04	0.05	0	0.03	0	2.97	1.04	4.01
Other Business Professionals	0.9	1.01	0	0	0	0	0.9	1.01	1.91
Other Departmental Managers	0.52	0.05	0.16	0	0	0	0.68	0.05	0.74
Other Middle Level Personnel	1.04	0.46	0.11	0	0	0	1.15	0.46	1.61
Other Social Science and Related Professionals	0.68	0.14	0.71	0	0	0	1.39	0.14	1.53
Personnel And Occupational Professionals	1.99	1.15	0.11	0	0	0	2.1	1.15	3.25
Protective Service Workers	3.52	1.31	0	0	0	0	3.52	1.31	4.83
Psychologists	0.19	0.14	0	0	0	0	0.19	0.14	0.33
Secretaries, Stenographers and Typists	1.01	2.86	0	0	0	0	1.01	2.86	3.87
Senior Officials Of Special Interest Organizations	0.3	0.16	0.05	0	0	0	0.35	0.16	0.52
Social Workers And Helpers	0.22	0.19	0	0	0	0	0.22	0.19	0.41
Sociologists, Anthropologists and Related Professionals	0.08	0.08	0	0	0	0	0.08	0.08	0.16

Minor Occupational Group	Citizenship and Sex								Total (%)
	Kenyan		EAC		Others		Total		
	Male	Female	Male	Female	Male	Female	Male	Female	
Specialised Departmental Managers	2.29	1.5	0.82	0.11	0.16	0	3.27	1.61	4.88
Specialised Departmental Managers	0.03	0	0	0	0	0	0.03	0	0.03
Statistical, and Planning Officials	0.16	0.08	0	0	0	0	0.16	0.08	0.25
Tax Assessor	0.05	0.05	0.11	0	0	0	0.16	0.05	0.22
Textile Bleaching, Dyeing And Cleaning Machine Operators	0.05	0	0	0	0	0	0.05	0	0.05
Waiters and Bartenders	0.3	0.19	0	0	0	0	0.3	0.19	0.49
Welfare and Pension Officials	0.05	0.03	0	0	0	0	0.05	0.03	0.08
Totals	**59.78**	**35.48**	**3.44**	**0.49**	**0.82**	**0**	**64.03**	**35.97**	**100**

Appendix 5: Employees by Skill Area and Skill Level

Skill Area	Skill Level								Total
	PhD	Master	Bachelor	Diploma	Certificate	Craft	Artisan	None	
Accountancy, Auditing And Tax Assessment	0.00	0.79	2.84	0.46	0.34	0.00	0.09	0.00	4.52
Agricultural and Materials-handling Machinery Operations	0.00	0.00	0.01	0.00	0.04	0.00	0.01	0.00	0.07
Agriculturalists And Related Professions	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.01
Aircraft Pilots and Related Work	0.00	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.03
Architectural And Town Planning	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.03
Archiving, Library And Related Professions	0.00	0.05	0.15	0.04	0.04	0.00	0.00	0.00	0.28
Athletics / Sportsmen and Related Work	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.01
Authors, Journalists And Related Professions	0.00	0.03	0.09	0.01	0.01	0.00	0.00	0.00	0.15
Blacksmiths, Tool-Making And Related Trades Work	0.00	0.00	0.01	0.09	0.15	0.00	0.08	0.00	0.34
Building Caretaking	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.03
Building Trades Work	0.00	0.00	0.00	0.12	0.26	0.00	0.04	0.00	0.42
Business and Administration	0.00	0.54	3.23	2.29	0.82	0.00	0.44	0.00	7.32
Buying, Appraisal and Auctioneering	0.00	0.01	0.07	0.00	0.00	0.00	0.00	0.00	0.08
Clerical- Cash	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Chemical Engineering Technology	0.00	0.01	0.08	0.42	0.79	0.03	0.26	0.00	1.59
Chemical Engineering And Technology	0.00	0.01	0.18	0.65	0.07	0.00	0.00	0.00	0.90
Civil Engineering	0.00	0.20	0.79	0.03	0.00	0.00	0.00	0.00	1.02
Civil Engineering And Related Technology	0.00	0.01	0.08	0.30	0.09	0.01	0.08	0.00	0.58
Computing	0.00	0.15	1.49	0.24	0.01	0.00	0.00	0.00	1.90
Construction and Maintenance	0.00	0.00	0.01	0.05	0.36	0.00	0.22	0.00	0.65
Cookery And Other Catering Service Work	0.00	0.00	0.01	0.26	0.42	0.00	0.48	0.00	1.17
Data Base And Networking	0.00	0.01	0.09	0.05	0.01	0.00	0.00	0.00	0.18
Decoration and commercial Design	0.00	0.00	0.03	0.00	0.01	0.00	0.00	0.00	0.04
Management-Directors And Chief Executives	0.00	0.08	0.08	0.00	0.01	0.00	0.01	0.00	0.19
Economics	0.00	0.20	0.35	0.01	0.01	0.00	0.00	0.00	0.58

Skill Area	Skill Level								Total
	PhD	Master	Bachelor	Diploma	Certificate	Craft	Artisan	None	
Electrical Engineering Technology	0.00	0.01	0.66	5.39	3.81	0.59	2.34	0.00	12.80
Electrical Equipment Fitting And Installation	0.00	0.00	0.00	0.15	1.35	0.00	0.20	0.00	1.70
Electrical, Electronics and Telecommunications Engineering	0.00	0.40	2.71	0.20	0.01	0.00	0.00	0.00	3.33
Electronics and Telecommunications	0.00	0.03	0.40	0.70	0.24	0.00	0.09	0.00	1.47
Field Crop, Vegetable And Horticultural Farm Work	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.04
Fishery, Wildlife and Tourism	0.00	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.03
Clerical- General Office	0.00	0.00	0.07	0.46	0.94	0.00	0.03	0.01	1.51
Government Administration	0.00	0.07	0.01	0.00	0.00	0.00	0.00	0.00	0.08
House Stewardship and Housekeeping	0.00	0.01	0.00	0.08	0.15	0.01	0.19	0.01	0.46
House Stewardship, Catering, Waiters And Related Work	0.00	0.00	0.00	0.09	0.11	0.00	0.00	0.00	0.20
Clerical- Information	0.00	0.01	0.04	0.20	0.20	0.00	0.03	0.00	0.48
Insurance Brokerage and Agency	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.03
Lands, Agricultural and Livestock sciences	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.01
Law	0.00	0.08	0.34	0.11	0.00	0.00	0.00	0.00	0.53
Clerical- Legal	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.05
Clerical- Library and Mail	0.00	0.01	0.04	0.46	0.35	0.00	0.00	0.00	0.86
Life Science	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.03
Life Science Technology	0.00	0.00	0.01	0.04	0.00	0.00	0.00	0.00	0.05
Machine Tool and other Metal-working Machine Operation	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.05
Machinery Mechanics And Fitting	0.00	0.00	0.00	0.04	0.05	0.00	0.03	0.00	0.12
Clerical-Material Recording and Transport	0.00	0.01	0.11	0.20	0.59	0.00	0.20	0.00	1.12
Mathematics And Related Professions	0.01	0.08	0.08	0.01	0.00	0.00	0.00	0.00	0.19
Mechanical Engineering And Related Technology	0.00	0.05	0.81	6.41	1.27	0.01	0.93	0.00	9.48
Mechanical Engineering	0.00	0.20	1.91	0.05	0.04	0.00	0.00	0.00	2.21
Medical technology And Clinical medicine	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.01
Messengers, Porters, Watchmen and Related Work	0.00	0.01	0.07	0.46	1.32	0.00	0.05	0.00	1.91
Metal Moulding, Welding, Structural-Metal Preparation And Related	0.00	0.00	0.01	0.19	0.54	0.00	0.50	0.00	1.24

Skill Area	Skill Level								Total
	PhD	Master	Bachelor	Diploma	Certificate	Craft	Artisan	None	
Trades Work									
Mining Engineering, Metallurgy And Related Technology	0.00	0.03	1.83	0.00	0.00	0.00	0.00	0.00	1.86
Mining Plant Operation	0.00	0.00	0.00	0.00	0.08	0.04	0.01	0.00	0.13
Not Elsewhere Classified	0.00	0.04	0.50	0.36	0.22	0.00	0.00	0.00	1.12
Motor Vehicle Driving	0.00	0.00	0.04	0.22	3.00	0.00	1.86	0.01	5.13
Non-Departmental Management	0.03	0.16	0.55	0.07	0.00	0.00	0.00	0.00	0.81
Clerical-Numerical	0.00	0.00	0.27	0.12	0.51	0.00	0.18	0.00	1.08
Nursing And Mid-Wifery	0.00	0.00	0.03	0.09	0.04	0.00	0.00	0.00	0.16
Other Administration And Management	0.00	0.47	0.65	0.19	0.04	0.00	0.00	0.00	1.35
Other Business Professions	0.00	0.09	0.36	0.19	0.34	0.00	0.00	0.00	0.98
Other Departmental Management	0.00	0.00	0.07	0.01	0.00	0.00	0.00	0.00	0.08
Other Middle Level administration	0.00	0.00	0.16	0.11	0.04	0.00	0.00	0.00	0.31
Other Sales and Service work	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.01
Other Social Science And Related Professions	0.00	0.08	0.18	0.01	0.00	0.00	0.00	0.00	0.27
Personnel And Occupational Professions	0.00	0.35	0.90	0.53	0.27	0.00	0.00	0.00	2.05
Physical And Chemical Science Technology	0.00	0.00	0.11	0.23	0.09	0.00	0.00	0.00	0.43
Physics And Related Professions	0.01	0.18	1.02	0.18	0.04	0.00	0.01	0.00	1.44
Plant and Machine Operation and Assembling Not Elsewhere Classified	0.00	0.00	0.01	0.03	0.34	0.00	0.00	0.00	0.38
Power Generating Plant Operation	0.00	0.01	0.32	1.67	1.04	0.05	2.30	0.00	5.40
Pre-primary Education Teaching	0.00	0.00	0.00	0.08	0.11	0.00	0.00	0.00	0.19
Printing and Binding Machine Operation	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.03
Production And Related Engineering	0.00	0.03	0.57	0.13	0.09	0.00	0.03	0.00	0.85
Protective Service Work	0.00	0.05	0.46	0.30	1.44	0.00	0.11	0.00	2.36
Psychology	0.00	0.01	0.07	0.00	0.00	0.00	0.00	0.00	0.08
Safety, Health and Quality Inspections/Control	0.00	0.01	0.07	0.00	0.00	0.00	0.00	0.00	0.08
Secretarial, Stenography and Typing	0.00	0.04	0.43	0.98	0.31	0.00	0.00	0.00	1.76
Ships' Engineering	0.00	0.01	0.03	0.00	0.00	0.00	0.00	0.00	0.04

Skill Area	Skill Level								Total
	PhD	**Master**	**Bachelor**	**Diploma**	**Certificate**	**Craft**	**Artisan**	**None**	
Social Advisory	0.00	0.03	0.18	0.11	0.00	0.00	0.00	0.00	0.31
Sociology, Anthropology And Related Professions	0.00	0.03	0.08	0.00	0.00	0.00	0.00	0.00	0.11
Specialised Departmental Management	0.03	1.05	1.20	0.40	0.11	0.00	0.05	0.00	2.84
Statistics, and Planning	0.00	0.03	0.04	0.03	0.01	0.00	0.00	0.00	0.11
Statistics	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.03
Steam Turbine Boiler and Engine Operators	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01
Stone, Clay, Cement and Other Mineral Products Machine Operation	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.04
Surveying And Cartography	0.00	0.12	0.38	0.08	0.00	0.00	0.00	0.00	0.58
Draughting Technology	0.00	0.00	0.00	0.04	0.03	0.00	0.00	0.00	0.07
Textile Bleaching, Dyeing and Cleaning Machine Operation	0.00	0.00	0.00	0.00	0.11	0.00	0.01	0.00	0.12
Transport and Freight Handling	0.00	0.00	0.01	0.18	0.03	0.00	0.01	0.00	0.23
Bar service	0.00	0.00	0.01	0.15	0.31	0.00	0.19	0.00	0.66
Welfare and Pension work	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.03
Well Drilling And Boring	0.00	0.03	0.28	2.03	0.96	0.00	1.12	0.00	4.42
Grand Total	**0.08**	**6.03**	**27.88**	**28.79**	**24.13**	**0.75**	**12.28**	**0.05**	**100.00**

Appendix 6: UNESCO Classification of Education

UNESCO CLASSIFICATION	**Description of components**
Teacher Training and Education Science	Teacher training from pre-school, kindergarten, elementary school, vocational, practical non-vocational subjects, adult education, teacher trainers and for handicapped children. General and specialized teacher training Programme Education science; curriculum development in non-vocational and vocational subjects, Educational assessment, testing and measurements, educational research, other education sciences.
Humanities and Arts	**Arts Fine Arts**: Drawing, Painting, Sculpture; Performing Arts: Music, Drama, Dance, Circus; Graphic and Audio Visual Arts: Photography, Cinematography, Music Production, Radio and T.V Production, Printing and Publishing Design; Craft Skills **Humanities, Religion and Theology**: Foreign Languages and Culture: Living or 'Dead' Languages and their Literature, Area Studies; Native Languages: Current or Vernacular Language and its Literature; Other Humanities: interpretation and Translation, Linguistics, Comparative Literature, History, Archeology, Philosophy, Ethics.
Social and Behavioral Sciences	Social and Behavioral Sciences: Economics, economic history, political science, sociology, demography, anthropology (except physical anthropology), ethnology, futurology, psychology, geography(except physical geography), peace and conflict studies, human rights
Journalism and Information	Journalism; Library Technician and Science; Technicians in Museums and similar repositories; Documentation Techniques; Archival Sciences.
Business and administration	Retailing, Marketing, Sales, Public Relations, Real Estate; Finance, Banking, Insurance, Investment Analysis; Accounting, Auditing, Book Keeping; Management, Public Administration, Institutional Administration, Personnel Administration; Secretarial and Office Work.
Law	Local Magistrates, 'notaires', law (general, International, Labor, Maritime, etc.) jurisprudence, History of law.
Life Sciences	Biology, Botany, Bacteriology, Toxicology, Microbiology, Zoology, Entomology, Ornithology, Genetics, Biochemistry, Biophysics, Other Allied Sciences, Excluding Clinical and Veterinary Sciences.
Physical Science	Astronomy and Space Sciences, Physics, Other allied subjects, Chemistry, Other allied subjects, Geology, Geophysics, Mineralogy, Physical Anthropology, Physical Geography and Other Geosciences, Meteorology and Other Atmospheric Sciences including climatic research, marine science, volcanology, paleoecology.
Mathematics and Statistics	Mathematics, Operations research, Numerical analysis, Actuarial Science, Statistics and other allied fields.
Computing	Computer Sciences: System Design, Computer Programming, Data Processing, Networks, Operating systems-software development only (hardware development should be classified with the engineering fields).
Engineering and	Engineering drawing, Mechanics, Metal work, Electricity, Electronics, Telecommunications, Energy and Chemical engineering, Vehicle Maintenance,

engineering trades	Surveying.
Manufacturing and Processing	Food and Drink Processing, Textiles, Clothes, Footwear, Leather, Materials (Wood, Paper, Plastic, Glass, etc.), Mining and Extraction.
Architecture and Building	Architecture and town Planning: Structural Architecture, Landscape architecture, Community Planning, Cartography; Building, Construction; Civil Engineering.
Agriculture, Forestry and fishery	Agriculture, crop and livestock production, agronomy, animal husbandry, horticulture and gardening, forestry and forest product techniques, natural parks, wildlife, fisheries, fishery science and technology.
Veterinary	Veterinary medicine, veterinary assisting.
Health	Medicine: Anatomy, Epidemiology, Cytology, Physiology, Immunology and Immuno, haematology, Pathology, Anesthesiology, Pediatrics, Obstetrics and gynecology, internal medicine, surgery, neurology, psychiatry, radiology, ophthalmology; Medical services: Public health services, hygiene, pharmacy, pharmacology, therapeutics, rehabilitation, prosthetics, optometry, nutrition; Nursing, Basic nursing and midwifery; Dental Services: dental assisting, dental hygienist, dental laboratory, technician, odontology.
Social services	Social care: care of the disabled, child care, youth services, gerontological services; social work: counseling, welfare not elsewhere classified (n.e.c)
Personal Services	Hotel and Catering, Travel and Tourism, Sports and Leisure, Hairdressing, Beauty Treatment, and Other Personal Services; cleaning, laundry, dry-cleaning, cosmetic services, domestic science.
Transport Services	Seamanship, Ship's officer, nautical science, aircrew, air traffic control, railway operations, road motor vehicle operations, postal service.
Environmental Protection	Environmental Conservation, Control and Protection, Air and Water pollution control, Labor Protection and security.
Security Services	Protection of property and persons: police work and related law enforcement, criminology, fire-protection and firefighting, civil security; military.
Not known or unspecified	(this category is not part of the classification itself but in data collection '99' is needed for 'fields of education not known or unspecified')

Appendix 7: Questionnaire

REPUBLIC OF KENYA

Confidential

S/NO (For Official Use)

MINISTRY OF LABOUR AND SOCIAL PROTECTION

STATE DEPARTMENT FOR LABOUR

SKILLS PROFILE -ENERGY SECTOR

EMPLOYER QUESTIONNAIRE

INSTRUCTIONS FOR COMPLETING THIS QUESTIONNAIRE

1. Please complete this questionnaire and return to the officer conducting this exercise or to **The Director, National Human Resource Planning &Development Department, P.O. BOX 40326- 00100, Nairobi** Tel. 2729800 Ext. 4142/4351 or visit our offices at NSSF Building Block "B", 14th Floor.
2. Where the space provided in the questionnaire is not adequate, extra information may be attached in a separate sheet using the same format.
3. The information may also be provided in soft copy using the same format.
4. The information given will be treated with strict confidentiality and used for planning purposes only.

A. GENERAL PARTICULARS

Name of Organization/Establishment…….

Nature of Establishment (exploration, extraction, generation, and transmission/transportation)……

Postal Address: ……Tel No /Mobile: …….

Website: ……E-Mail: ……

County: ……Sub County: ……..

Town: ……Building: ……

Road/Street: …….

Q1.Indicate the number of employees in your establishment by **Job title** (occupation), **sex** and **nationality**

S/No	Job Title (Geologist, Cartographer)	Sex		Nationality		
		Male	Female	Kenyan	Other EAC Countries	Others

Q2.Indicate the **skills possessed** by all the employees in your establishment **by skill area** and **level.**

S/No.	Current Main Occupation	Skill Area (e.g Chemical engineering, geology)	Skill levels,					
			PhD	Masters	Bachelor's Degree	Diploma	Certificate	Others (Artisan, Craft)

Q3. Indicate the number of **vacancies** in your establishment in the last 12 months by **occupation** and **skill area** and give the reasons.

S/No	Occupation (Job title)	Skill area (Geo physics, Hydrology)	In post	Number of Vacancies	Reasons for vacancies

Q4.Below are some difficulties faced by establishments in meeting the demand for **skilled personnel**. Tick against the given choices if applicable and state the measures you have put in place to address the difficulty (ies) identified.

S/No	Difficulty	Tick	Measure(s) to address the difficulty
	Unavailability of trained personnel		i) ii) iii)
	Inability to pay		i) ii) iii)
	Graduates from training institutions lack practical skills		i) ii) iii)
	High labour turnover		i) ii) iii)
	Unfavorable climatic conditions		i) ii) iii)
	Others (specify		

Q5.Indicate Future skill requirements in your establishment for next five (5) years

S/No	Skill Area (e g Chemical engineering, Geology)	Skill levels					
		PhD	Masters	Bachelor's Degree	Diploma	Certificate	Others (Artisan, craft)

Any additional Remarks

_____

_____

Thank you for your cooperation!

Contact Details

Name of Person filling the questionnaire……

Designation……

Mobile /Telephone number……

Email (optional)……

Signature…….. Date……

Official Stamp……

Name of officer administering the questionnaire…….

Signature……..……..……