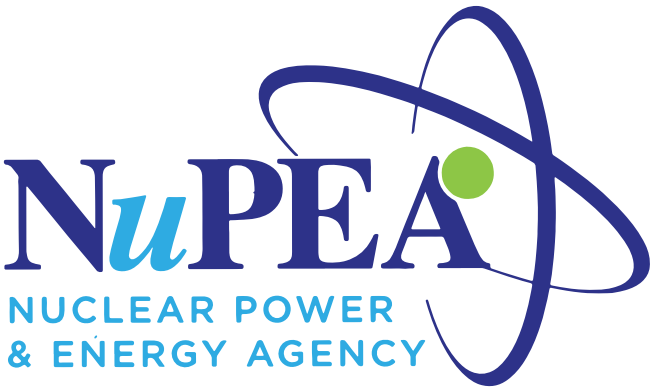
STRATEGIC PLAN

2020/21-2024/25

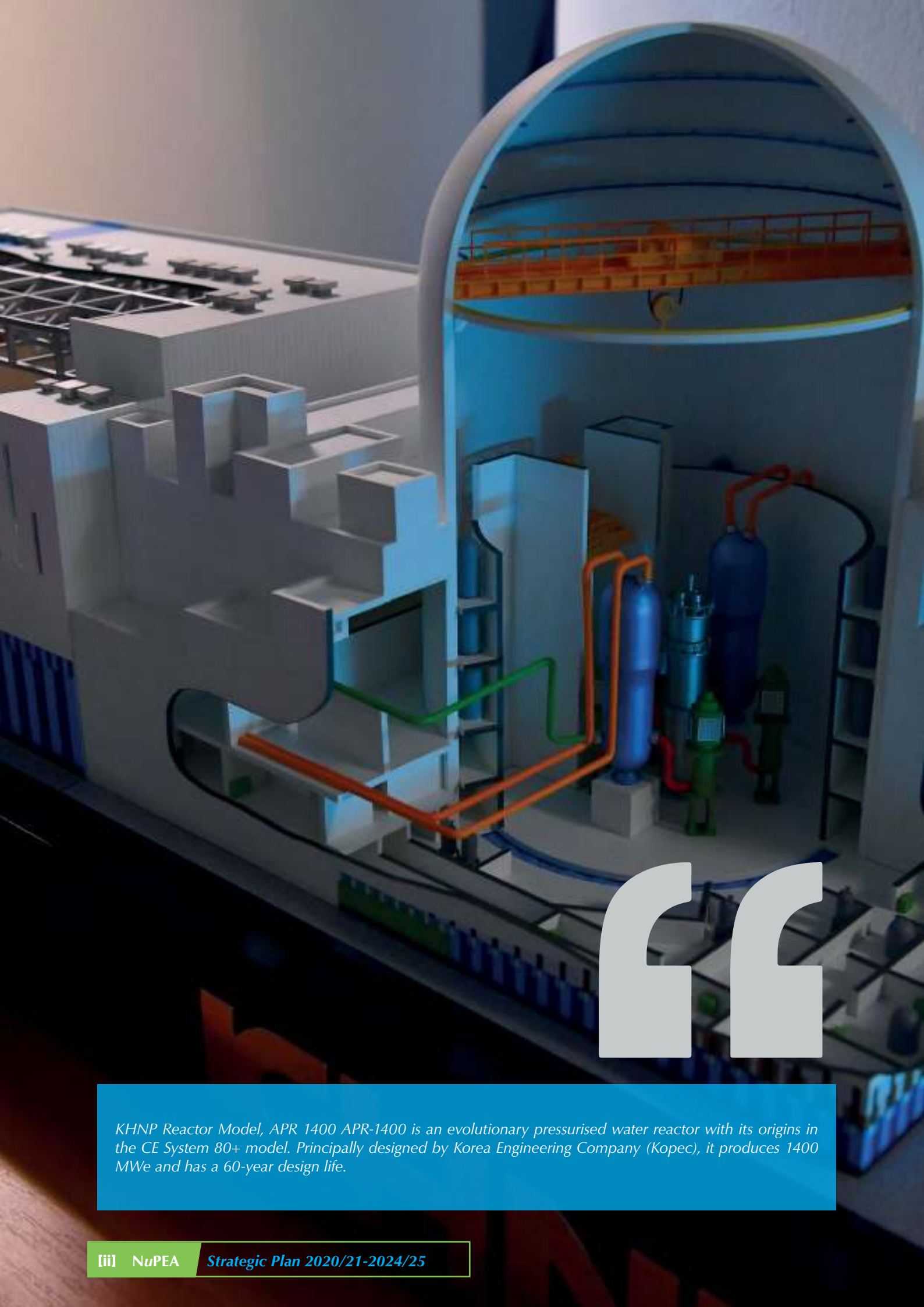
NuPEA
NUCLEAR POWER
& ENERGY AGENCY

JUNE 2020



STRATEGIC PLAN (2020-2025)

DECEMBER 2020



KHNP Reactor Model, APR 1400 APR-1400 is an evolutionary pressurised water reactor with its origins in the CE System 80+ model. Principally designed by Korea Engineering Company (Kopec), it produces 1400 MWe and has a 60-year design life.

OUR VISION, MISSION STATEMENT

VISION

01 *A premier hub for nuclear power development and sustainable energy solutions*

To develop nuclear power, and undertake research and capacity building in the energy and petroleum sectors for socio-economic prosperity 02

MISSION

CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

BOD	-	Board of Directors
CEO	-	Chief Executive Officer
CSR	-	Corporate Social Responsibility
DCS	-	Director, Corporate Services
DER&CD	-	Director, Energy Sector Research and Capacity Development
DIA&C	-	Director, Information Advocacy and Communication
DLRS&CS	-	Director, Legal & Regulatory Services and Corporation Secretary
DNEID	-	Director, Nuclear Energy Infrastructure Development
DS&P	-	Director, Strategy and Planning
EPRA	-	Energy and Petroleum Regulatory Authority
ERP	-	Enterprise Resource Planning
EPT	-	Energy and Petroleum Tribunal
GDC	-	Geothermal Development Company
GHG	-	Greenhouse Gas
GWh	-	Gigawatt hours
HRD	-	Human Resource Development
IAEA	-	International Atomic Energy Agency
ICT	-	Information and Communications Technology
IEC	-	Information, Education & Communication
IMS	-	Integrated Management System
INDC	-	Intended Nationally Determined Contribution
IPPs	-	Independent Power Producers

IRRS	-	Integrated Regulatory Review Service
ISMS	-	Information Security Management Systems
ISO	-	International Organization for Standardization
KenGen	-	Kenya Electricity Generating Company
KETRACO	-	Kenya Electricity Transmission Company
KNEB	-	Kenya Nuclear Electricity Board
KRAs	-	Key Result Areas
KPLC	-	Kenya Power and Lighting Company
KWh		Kilowatt hour
LCPDP	-	Least Cost Power Development Plan
MHRA	-	Manager, Human Resource and Administration
MICT	-	Manager, Information Communication Technology
MF&A	-	Manager, Finance and Accounts
MOE	-	Ministry of Energy
MTPs	-	Medium Term Plans
NEPC	-	Nuclear Electricity Project Committee
NEPIO	-	Nuclear Energy Programme Implementing Organization
NESC	-	National Economic & Social Council
NFC	-	Nuclear Fuel Cycle
NGO	-	Non-Governmental Organization
NPP	-	Nuclear Power Programme
KNRA	-	Kenya Nuclear Regulatory Authority
N*u*PEA	-	Nuclear Power and Energy Agency
PESTEL	-	Political, Economic, Socio-cultural, Technological, Ecological and Legal
PM	-	Procurement Manager

QMS	-	Quality Management System
R&D	-	Research and Development
REREC	-	Rural Electrification and Renewable Energy Corporation
RWM	-	Radioactive Waste Management
SDGs	-	Sustainable Development Goals
SEED	-	Site & External Events Design
SMRs	-	Small Modular Reactors
SST	-	Site Selection Team
SWOT	-	Strengths, Weaknesses, Opportunities and Threats
TWh	-	Terawatt-Hours

FOREWORD

The Nuclear Power and Energy Agency N*u*PEA was established in 2019 under the Energy Act No.1 of 2019 and succeeded the Kenya Nuclear Electricity Board (KNEB).

N*u*PEA is mandated to fast-track the development and implementation of the nuclear power programme in Kenya, carry out research and development, and capacity building in the energy and petroleum sectors. N*u*PEA has been implementing the 15-year roadmap that was developed by KNEB in 2013 to provide the strategic direction in nuclear electricity development in Kenya.

The enhanced mandate of N*u*PEA necessitated a review of the roadmap to incorporate the additional functions. Thus, the 2020-2025 Strategic Plan seeks to streamline the execution of N*u*PEA's mandate as outlined in the Act and other relevant legal and policy instruments. Further, it also seeks to provide strategic direction for

the implementation of the Agency's activities for the period 2020-2025 and to provide an overall framework for efficient allocation and utilization resources.

The development of this Strategic Plan adopted a consultative approach that involved the Board, Management, staff and other stakeholders. The strategic plan communicates N*u*PEA's vision, mission, and strategies put forth to achieve its mandate. The Agency identified five Key Result Areas (KRAs) namely Nuclear Energy Infrastructure Development; Public Education and Stakeholder Engagement; Energy Research and Development; Energy Sector Capacity Building; and Institutional Capacity. Successful implementation of the Plan will lead to the following outcomes:

1. Progress in the development of the requisite infrastructure for construction, operation, maintenance and decommissioning of a nuclear power plant safely and securely;
2. Enhanced understanding, social acceptance, and support for the nuclear power programme as well as increased stakeholder support and participation in energy research and capacity building;
3. Developed research infrastructure, enhanced human resource capacity in the energy and petroleum sectors, strengthened collaboration with local and international research and academic institutions;
4. Developed coordination and implementation framework for capacity building in the energy and petroleum sectors; and
5. Good corporate governance practices, enhanced human capital management and establishment of quality management systems.

The Board is committed to the successful implementation of the Strategic Plan. Specifically, the Board will spearhead implementation of resource mobilization strategies to enhance the Agency's financial base, ensure prudent resources utilization and support establishment of effective institutional structures. The Board will also continuously provide policy direction and ensure the Agency delivers on its mandate and upholds utmost integrity, collaborative teamwork, excellence, creativity and innovativeness in nuclear power programme development, energy research and capacity building programs.

I appeal to all stakeholders and development partners to support programs stipulated in this Strategic Plan in order to achieve the country's aspirations of safe, affordable and sustainable energy solutions.

The enhanced mandate of NuPEA necessitated a review of the roadmap to incorporate the additional functions.

MR. EZRA ODHIAMBO
CHAIRMAN,
BOARD OF DIRECTORS
NUCLEAR POWER AND ENERGY AGENCY

PREFACE

This Strategic Plan has been developed in line with the mandate of the Agency as stipulated in the Energy Act No.1 of 2019 to guide promotion and development of nuclear power for electricity generation, conduct energy research and development as well as strengthen the capabilities of the energy and petroleum sectors. The goals and initiatives in this Plan will guide the Agency for the next five years, in cognizance of the country's development priorities as outlined in the Big Four Agenda, the Vision 2030 and Medium-Term Plans, and other regional and global development blueprints, including the Africa Agenda and the Sustainable Development Goals.

The Plan has identified five KRAs namely Nuclear Energy Infrastructure Development; Public Education and Stakeholder Engagement; Energy Research and Development; Energy Sector Capacity Building; and Institutional Capacity. During the five-year implementation period, the Agency's strategic objectives are to:

i. Ensure readiness of key nuclear power infrastructure;

ii. Have an adequate and supportive legal and regulatory framework;

iii. Inculcate nuclear safety culture among the key stakeholders;

iv. Increase stakeholder's awareness and support of N*u*PEA's mandate;

v. Champion use of safe, efficient and sustainable energy systems;

vi. Enhance uptake of new technologies and innovations in the energy and petroleum sectors;

vii. Ensure availability of skilled and competent human capital in the Energy and Petroleum sectors;

viii. Enhance good corporate governance;

ix. Promote a positive corporate image;

x. Have a versatile, competent, highly performing and motivated workforce;

xi. Enhance efficiency and effectiveness in service delivery; and

xii. Enhance financial sustainability of the Agency.

This Strategic Plan will be used as a tool to estimate and measure the progress of the Agency in achievement of its mission, vision and strategic objectives. The Agency will collaborate and partner with stakeholders in executing planned activities towards achievement of its objectives. Internally, the Agency will continue to build and equip a cohesive team that will develop and execute programmes that support the goals of this Strategic Plan, and design a system for tracking progress made in each key result area.

I wish to highlight the key role of stakeholders and local and international partners towards achievement of all objectives set out in this plan. I look forward to enhanced partnerships and collaboration in various activities and projects that will provide enhanced energy services for the benefit of our country.

Finally, I wish to acknowledge the participation by various groups of stakeholders. All their contributions were instrumental in the successful preparation of this 2020 - 2025 Strategic Plan. Further, I appeal for continued support to ensure the successful implementation of the Plan.

The goals and initiatives in this Plan will guide the Agency for the next five years, in cognizance of the country's development priorities as outlined in the Big Four Agenda, the Vision 2030 and Medium-Term Plans, and other

Eng. Collins Juma, MBS.
CHIEF EXECUTIVE OFFICER

EXECUTIVE SUMMARY

Kenya Nuclear Electricity Board (KNEB) was established in 2012 with the mandate to fast-track the development and implementation of the nuclear power programme in Kenya. In furtherance of its mandate, the Agency developed a 15 Years Strategic Plan for the implementation of nuclear power programme in Kenya.

In order to incorporate the new mandate in its strategy as well as take stock of its achievements to date, the Agency developed this five-year Strategic Plan. The Strategic Plan was developed through a participatory process which included consultation with internal and external stakeholders. The Strategic Plan has taken cognizance of the national development agenda as contained in various policy documents including the Constitution, Vision 2030, Medium Term Plan III, the Big 4 Agenda, Kenya National Spatial Plan and Climate Change Policy Goals and Kenya's Intended Nationally Determined Contribution.

Situational analysis was carried out and highlights the current status of electric power at the global, regional and national level. In addition, a review of the implementation of the 15-year roadmap for nuclear power programme development resulted in documentation of achievements to date, challenges and lessons learnt during the period. Environmental analysis was also undertaken using the Strengths, Challenges, Opportunities and Threats (SWOT) and Political, Economic, Social-Cultural, Technological, Environmental and Legal (PESTEL) models to identify factors that may influence N*u*PEA's operating environment and its strategic response. Further, stakeholder analysis was undertaken to identify N*u*PEA's key stakeholders, their expectations and strategies needed towards meeting these expectations.

In 2019, through the Energy Act, KNEB was transformed to Nuclear Power and Energy Agency (N*u*PEA) and its mandate expanded to include promoting and implementing Kenya's Nuclear Power Programme, carrying out research and development, and capacity building in the energy and petroleum sectors.

The situational analysis culminated in the identification of N*u*PEA's 2020-2025 strategic model including vision, mission, core values and key results areas (KRAs).

VISION

A premier hub for nuclear power development and sustainable energy solutions

MISSION

To develop nuclear power, and undertake research and capacity building in the energy sector for socio-economic prosperity

KRA	Nuclear Energy Infrastructure Development	Public Education and Stakeholder Engagement	Energy Research and Development	Energy Sector Capacity Building	Institutional Capacity
Strategic Objectives	• Ensure readiness of key nuclear power infrastructure • Have an adequate and supportive legal and regulatory framework • Inculcate nuclear safety culture among the key stakeholders	• Increase stakeholder's awareness and support of NuPEA's mandate	• Champion use of safe, efficient and sustainable energy systems • Enhance uptake of new technologies and innovations in the energy and petroleum sectors	Ensure availability of skilled and competent human capital in the Energy and Petroleum sectors	• Enhance good corporate governance • Promote a positive corporate image • Have a versatile, competent, highly performing and motivated workforce • Enhance efficiency and effectiveness in service delivery • Enhance financial sustainability of the Agency

Core Values

I-TEC: Integrity, Teamwork, Excellence, and Creativity and innovativeness

To deliver on these key result areas, strategic objectives and appropriate strategies were formulated. To operationalize the objectives and strategies, an implementation plan was developed documenting for each strategy, the proposed activities, output indicators, timeline, targets, budget and the responsible office.

Governance and resource requirements for effective implementation of the strategic plan were assessed and is documented in chapter four. During the plan period, the Agency will require about Kshs 19.7 billion to implement the initiatives in the plan while the recurrent budget over the period is estimated to be Kshs 5.2 billion. A coordination framework to guide implementation of the Strategic Plan has also been provided. In addition, potential risks that may hinder successful implementation of the plan were identified and appropriate mitigation measures recommended. A monitoring, evaluation, reporting and learning (MERL) framework to be used in tracking progress of implementation of the strategic plan is provided in chapter five. The MERL framework will enable periodic reviews and timely corrective actions.

Ministry of Energy

NEPC

NEPC- The main task of the Committee was to conduct preliminary technical studies and advise the government and enable it to make a knowledgeable decision in regard to the development of a nuclear power programme. The Committee completed a Prefeasibility Study, a Self Assessment exercise which was subjected to a Review (Integrated Nuclear Infrastructure Review) by the International Atomic Energy AGency, IAEA. Following the findings of the study and the Government's decision, the Committee was expanded to a Board, the Kenya NUclear Electricity Board and mandated to fasttrack the development of the prerequisite infrastructure for the launch of a civil nuclear power programme.

KNEB

KNEB- developed a 15 year Roadmap for the development of nuclear power infrastructure following the IAEA's Milestones Approach. The Board commenced the development of the infrastructure including the identification and development of potential nuclear power plant sites, reactor technology assessments, enactment of enabling laws and legislations, human resource development, public education and stakeholder engagement, grid studies, among others. The Board attained the Nilestone 1 of the infrastructure development and started preparations for Phase 2 of nuclear power programme development

N*u*PEA

The Energy Act No.1 of November 2019 transformed KNEB to NuPEA with an expanded mandate of energy research and development and capacity building in the Energy and Petroleum Sectors. The Agency id=s implementing the Phase activities of the Nuclear Power Programme development and readying the construction and commissioning of the first nuclear power plant project. The Agency has additionally taken up the roles of coordinating research and capacity building in the energy and petroleum sectors with an aim of enhancing their effectiveness in providing efficient and sustainable energy solutions.

CHAPTER ONE

INTRODUCTION

1.1 INSTITUTIONAL BACKGROUND

The drive towards the use of nuclear power in Kenya's electricity mix started in 2010 when the National Economic & Social Council (NESC) recommended its use to meet the growing electricity demand. In November 2010, the Government established Nuclear Electricity Project Committee (NEPC) to steer the nuclear energy generation programme. NEPC was later transformed to Kenya Nuclear Electricity Board (KNEB) vide Gazette Notice No. 131, Supplement 156 of 23rd November, 2012. The mandate of KNEB was to fast-track the development and implementation of the nuclear power programme in order to enhance the production of affordable and reliable electricity in Kenya. In November 2013, KNEB developed a 15-year roadmap for the Kenya Nuclear Power Programme (NPP). The roadmap identified 22 infrastructure issues to be addressed in the implementation of the NPP.

Through the Energy Act, 2019, KNEB was transformed to Nuclear Power and Energy Agency (N*u*PEA) which is a State Corporation under the Ministry of Energy. The Act expanded the Agency's mandate to include promoting and implementing Kenya's Nuclear Power Programme, carrying out research and development, and capacity building in the energy and petroleum sectors. The institutional arrangement in the Ministry of Energy (MOE) is shown in Figure 1.

Since its establishment, the Agency has made significant milestones in the implementation of the 15-year roadmap for the Kenya Nuclear Power Programme. Some of the key milestones include finalization of a Pre-Feasibility Study for the introduction of the Nuclear Power Programme, establishment of cooperation and collaboration with stakeholders locally, regionally and internationally, accession of some of the international treaties and conventions, enactment of The Nuclear Regulatory Act in 2019 and finalization of the International Atomic Energy Agency (IAEA) Integrated Nuclear Infrastructure Review (INIR) and Site and External Events Design (SEED) review mission The achievements to-date are highlighted in Section 2.3.

> In 2019, through the Energy Act, KNEB was transformed to Nuclear Power and Energy Agency (N*u*PEA) and its mandate expanded to include promoting and implementing Kenya's Nuclear Power Programme, carrying out research and development, and capacity building in the energy and petroleum sectors.

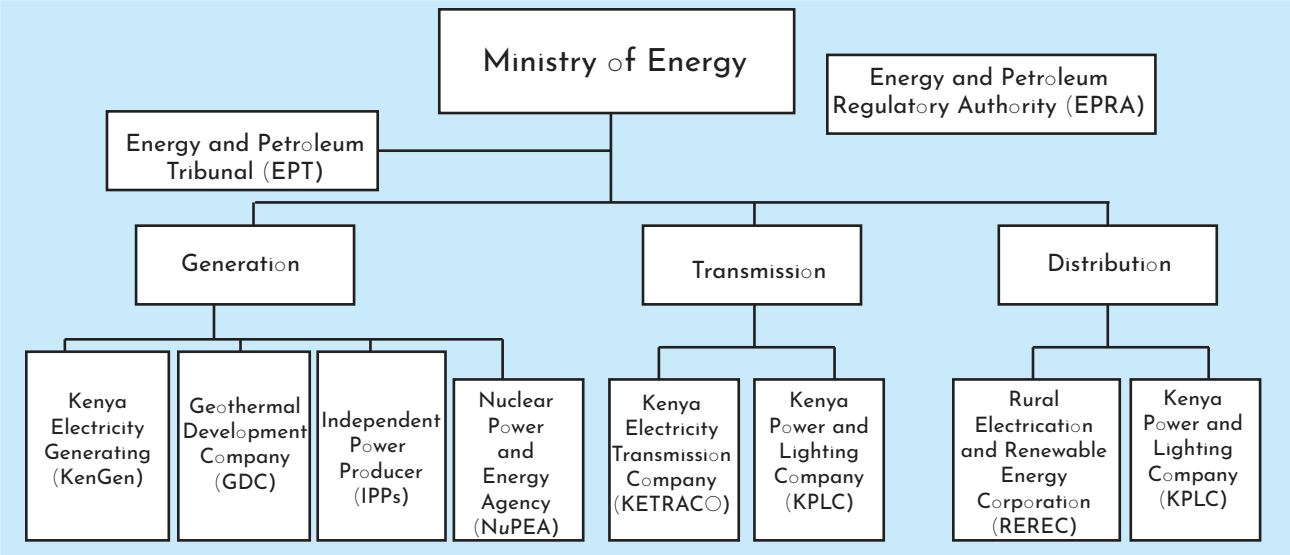


Figure 1: Institutional Arrangement in the Ministry of Energy

1.2 MANDATE AND FUNCTIONS OF N*u*PEA

The Agency's mandate as stipulated in Section 56(1) of the Energy Act, 2019, are to:

a. B.e the nuclear energy programme implementing organization and promote the development of nuclear electricity generation in Kenya; and

b. Carry out research, development and dissemination activities in the energy and petroleum sectors in Kenya.

The specific functions of the Agency as stipulated in Section 56(2) of the Energy Act, 2019 are presented in Appendix I. Based on these, the Agency's broad functions are to:

i. Promote the development of nuclear electricity generation in Kenya;

ii. Undertake public education and awareness creation on Kenya's nuclear power programme;

iii. Carry out research and development in the energy and petroleum sectors;

iv. Disseminate research findings and innovations; and

v. Undertake capacity building in the energy and petroleum sectors.

1.3 RELEVANT LEGISLATIONS AND POLICIES

Operations of N*u*PEA are guided by the Energy Act, 2019. However, as a government institution, the Agency must comply with other government legislations, policies, circulars and guidelines.

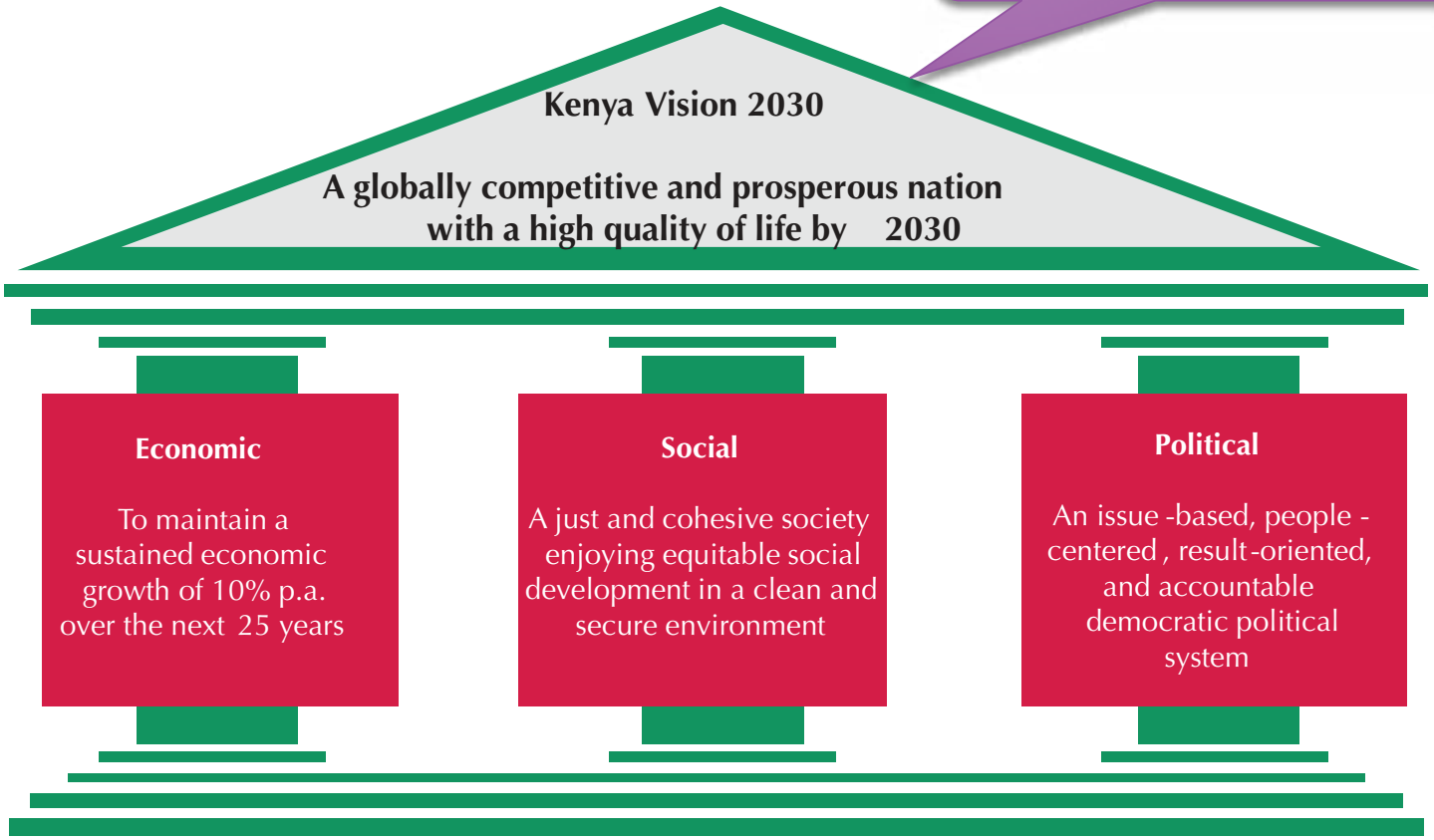
Table *1* provides details of some of the legislations and policies that are relevant to N*u*PEA.

1954 The USSR's Obninsk nuclear power plant becomes the first to generate electricity power for the grid

World's Second Nuclear Power Plant at Calder Hall UK 1956

POWER IS A KEY ENABLER FOR VISION 2030

A sustained economic growth of 10% per annum from year 2015



Key Enabler:

A vibrant power sector that meets electricity required to drive flagship projects and programmes

The Vision 2030 identities energy (moreso competitively priced, stable, clean and reliable electricity) as a key prerequisite of sustained economic growth and transformation

Table 1: Relevant Legislations and Policies

NO	Policy/Framework/Legislation	Relevance to NuPEA
	Constitution of Kenya, 2010	Provides national values and principles of governance
	Kenya Vision 2030, 3rd Medium Term Plan (MTP III) 2018-2022, and the Big Four Agenda	Sets out the Kenya's development agenda and the current government priorities
	African Agenda, 2063	Provides a roadmap for social economic transformation of the African continent over the next fifty years
	Sustainable Development Goals	Provides a framework to enhance the quality of life of the world's citizens
	The Nuclear Regulatory Act, 2019	Provides a comprehensive framework for the regulation of safe, secure and peaceful utilization of atomic energy and nuclear technology
	Environmental Management and Coordination Act 1999 (Revised 2012) and its amendment (2015)	Provides guidelines on the national environmental protection
	The Land Act, 2012	Provides for the sustainable administration and management of land and land-based resources
	Physical and Land Use Planning Act, 2019	Governs matters relating to planning, use, regulation and development of land in Kenya
	State Corporations Act, Cap 446	Provides for the control and regulation of state corporations in Kenya
	Public Procurement and Asset Disposal Act, 2015	Provides procedures for efficient public procurement and for assets disposal by public entities
	Public Finance Management Act, 2012	Provides for the effective management of public finances
	Public Officer Ethics Act, 2003 revised edition 2016	Advances the ethics of public officers
	Science, Technology and Innovation Act, 2013 (Revised 2014)	Regulates the progress of science, technology and innovation in the country
	Technical and Vocational Education and Training (TVET) Act, 2013	Provides for technical and vocational education and training
	National Energy Policy, 2018	Provides policy framework to guide the development of the country's energy sector
	National Environment Policy, 2013	Proposes a broad range of integrated measures and actions responding to key environmental issues and challenges in the country
	Sessional Paper No. 1 of 2005, Sessional paper No. 9 of 2012, and Sessional paper No. 1 of 2019	Provides direction on matters related to education, research and development
	Infrastructure Sector Plan (2018-2022)	Provides policies, programmes and projects to be implemented during the period 2018-2022

NO	Policy/Framework/Legislation	Relevance to N*u*PEA
	Country Programme Framework (CPF) for the period 2017–2022	Provides for the medium-term planning of technical cooperation with IAEA and identifies priority areas where the transfer of nuclear technology and technical cooperation resources will be directed to support Kenya development goals
	Ministry of Energy Strategic Plan 2018 - 2022	Provides the strategic direction for the development of the country's energy sector
	The 15-Year Strategic Plan for a Nuclear Power Programme in Kenya	Provides a road map to guide the development of national nuclear infrastructure
	Least Cost Power Development Plan (LCPDP)	Guides the country's electricity generation and transmission system planning
	National Spatial Plan (2015 -2045)	Provides a roadmap for integrated planning for balanced and sustainable national development
	Mwongozo (The Code of Governance for State Corporations)	Provides guidelines for corporate governance in state corporations
	State Corporations Advisory Committee (SCAC) guidelines	Guides management of state corporations

1.4 ROLE OF N*u*PEA IN THE NATIONAL DEVELOPMENT AGENDA

The national development agenda is stipulated in the Kenya Vision 2030 and other policy documents as highlighted below.

1.4.1 Kenya Vision 2030

The Country's long-term development agenda is set out in the Kenya Vision 2030. The aim of Vision 2030 is to make Kenya a globally competitive and prosperous country with a high quality of life by 2030. The Vision 2030 is anchored on three pillars: economic, social and political pillars. Within the Vision 2030, energy is recognised as a key enabler. To achieve an average economic growth rate of 10 per cent per annum as envisioned in the economic pillar, the country needs adequate, affordable and reliable energy as demand is expected to grow as a result of implementation of various flagship projects under each pillar. In addition, as incomes increase and urbanization intensifies, the demand for energy is also expected to rise. Further, accelerated connection in both rural and urban areas through the Last Mile Connectivity initiative is also expected to increase demand for power.

To meet the anticipated demand, nuclear energy is under consideration for inclusion in the country's power generation mix. N*u*PEA, being the nuclear energy programme implementing organization (NEPIO), has an important role to play in attainment of Vision 2030 aspirations by enhancing access to clean, affordable, reliable and efficient energy in the country. The Agency is also expected to play a critical role in accelerating economic development by raising productivity and efficiency levels across the three pillars through coordination of research and development (R&D) and capacity building activities/ initiatives in the energy and petroleum sectors.

1.4.2 Third Medium Term Plan 2018-2022 and Big 4 Agenda

The Vision 2030 is implemented through five-year Medium-Term Plans (MTPs). The third MTP (2018-2022), focuses on implementing policies, programmes and projects designed to deliver on the Big Four Agenda initiatives. The Big Four Agenda are: manufacturing, food security, universal health coverage and affordable housing.

The third MTP has identified various priority projects for the energy sector including increasing power generation, nuclear power programme development, distribution network expansion and improvement, and improved power supply reliability. N*u*PEA is expected to contribute towards MTP III and the Big Four Agenda by:

a. Promoting the generation of nuclear electricity in Kenya in order to enhance sustainable energy provision for socio-economic advancement;

b. Enhancing productivity and efficiency through capacity building, research and development as well as promoting application of various innovations in the energy and petroleum sectors.

c. Developing, coordinating, promoting and building the capacity of stakeholders in the application of nuclear technology and innovation through technical cooperation projects in the country under the National Liaison Office. These projects span across various sectors including health, water and sanitation, agriculture, manufacturing as well as energy.

1.4.3 National Spatial Plan

The National Spatial Plan (2015-2045) is an integrated spatial plan for balanced and sustainable national development that provides a framework, strategies and policies to facilitate sustainable exploitation of Kenya's potential in agriculture, tourism, energy, water, fishing and forestry. It is expected to reduce regional inequalities that have existed by ensuring that some regions are no longer perceived as low potential but as differently endowed.

N*u*PEA will contribute towards the reduction of regional inequalities by facilitating provision of safe, efficient, clean and sustainable electricity for socio-economic advancement of various regions in the country. In addition, through research and capacity development, the Agency is expected to facilitate regional development by promoting the adoption of energy efficient technologies throughout the country.

1.4.4 African Agenda 2063

Agenda 2063 is Africa's blueprint and master plan for transforming Africa into the global powerhouse of the future. It is the continent's strategic framework that aims to deliver on its goal for inclusive and sustainable development. The overarching vision is "an integrated, prosperous and peaceful Africa, driven by its own citizens and representing a dynamic force in the international arena". This vision is to be achieved through seven aspirations. These aspirations have been integrated in the MTP III.

Apart from provision of clean and affordable electricity, nuclear energy has a wide range of applications in medicine, industry, research, education and training. These applications will contribute to the Agenda aspirations of inclusive growth and high quality of life. Thus, N*u*PEA being a National Liaison Office will continue to promote and coordinate application of nuclear science and technology in the country and Africa.

Sustainable Development Goal 7; Access to Affordable, Reliable, Sustainable, and Modern Energy for All. Attainment of SDG 7 is seen to be a focal point that will influence the success of other SDGS.

1.4.5 Sustainable Development Goals

The Sustainable Development Goals (SDGs) were adopted by all United Nations member states in 2015 as a universal call to action to end poverty, protect the planet and ensure that all people enjoy peace and prosperity by 2030. There are 17 SDGs with the most relevant goal for N*u*PEA being number 3: Good health and well-being; and number 7: Affordable and clean energy.

As a NEPIO, N*u*PEA is expected to play a key role in the realization of the above-mentioned SDGs by promoting:

a. Application of nuclear science and technology in health;

b. Development of nuclear electricity generation in Kenya as a clean and affordable energy source that can contribute to minimization of greenhouse gas (GHG) emissions and thereby reducing the hazardous impacts of climate change; and

c. Development and implementation of clean and affordable energy systems in the country through R&D, innovation and capacity building in the energy and petroleum sectors.

1.4.6 Climate Change Policy Goals and Kenya's Intended Nationally Determined Contribution

The goal of Kenya's Intended Nationally Determined Contributions (INDC) is to lower greenhouse gas (GHG) emissions by 30% by 2030. This is evidenced by the submission of its INDC to the United Nations Framework Convention on Climate Change (UNFCCC) in July 2015 and the ratification of the Paris Agreement on 28th December 2016, which came into force on 27th January 2017. The National Climate Change Action Plan (NCCAP) provides a vision for low carbon, climate resilient development pathways and effective response to climate change.

The action plan is being operationalized through the implementation of climate change adaptation and mitigation actions in various areas such as geothermal and other clean energy development, energy efficiency, climate smart agriculture, and drought management.

N*u*PEA will contribute to climate change adaptation and mitigation through promotion of nuclear electricity as a clean and low GHG emission source of energy in the country's energy mix. This will provide safe and clean energy sources for national development while protecting the environment. Adoption of nuclear power generation will also offer a reliable source of baseload electricity that is resilient to climatic conditions.

1.4.7 Country Programme Framework

A Country Programme Framework (CPF) provides a reference framework for medium-term planning of technical cooperation between a member state and IAEA. On 30th May 2017, Kenya signed its 4th CPF for 2017–2022 period with IAEA. The framework has identified priority areas where the transfer of nuclear technology and technical cooperation resources will be directed to support national development goals.

The current CPF has identified eight national priority areas that will require cooperation and technical support from the IAEA. These areas are food and agriculture, human health, water resources management, environmental management, industrial applications, sustainable energy development, capacity building in nuclear science and technology, and strengthening national radiation safety and nuclear security. During the plan period, N*u*PEA is expected to coordinate implementation of CPF, with the National Liaison Office playing a major role in facilitating technical cooperation between Kenya and IAEA.

1.5 RATIONALE/OBJECTIVE OF THE STRATEGIC PLAN

In line with its mandate, the Agency is expected to play a key role in national development through promotion of nuclear power, and undertaking capacity building and research in the energy and petroleum sectors. Thus, the development of this 5-year strategic plan is informed by the need to:

a. Streamline the execution of N*u*PEA's mandate as outlined in the Energy Act, 2019 and other relevant legal and policy instruments;

b. Provide strategic direction for the implementation of the Agency's activities for the period 2020-2025;

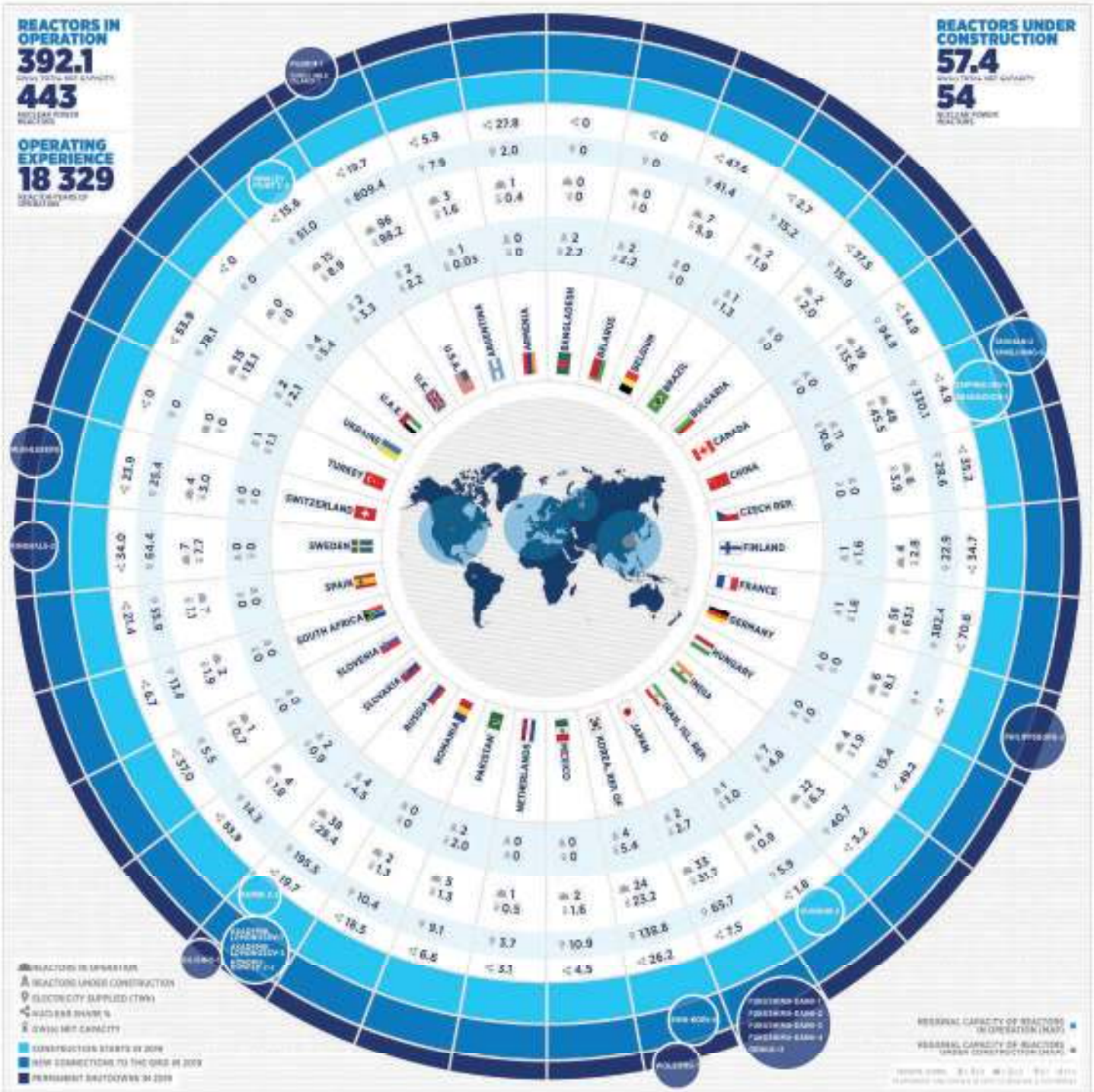
c. Align the strategic direction of the Agency with the relevant national, regional and global development agenda(s); and

d. Provide an overall framework for efficient allocation and utilization of the Agency's resources.

1.6 METHODOLOGY OF DEVELOPING THE PLAN

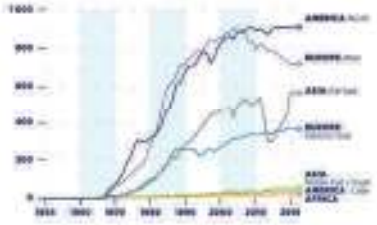
In the development of this Strategic Plan, a participatory strategic planning process was adopted where key stakeholders of the Agency were involved at different stages with an aim of enhancing ownership for effective and efficient implementation of the Strategic Plan. Specifically, the process entailed review of relevant documents, interviews/discussions with the Board, management and key stakeholders. Strategic planning workshops with management, Board and stakeholders were also held.

NUCLEAR POWER STATUS 2019

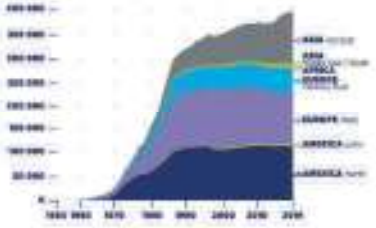


ELECTRICITY SUPPLIED BY TYPE OF REACTORS

REGIONAL ELECTRICITY PRODUCTION OVER TIME - TWh



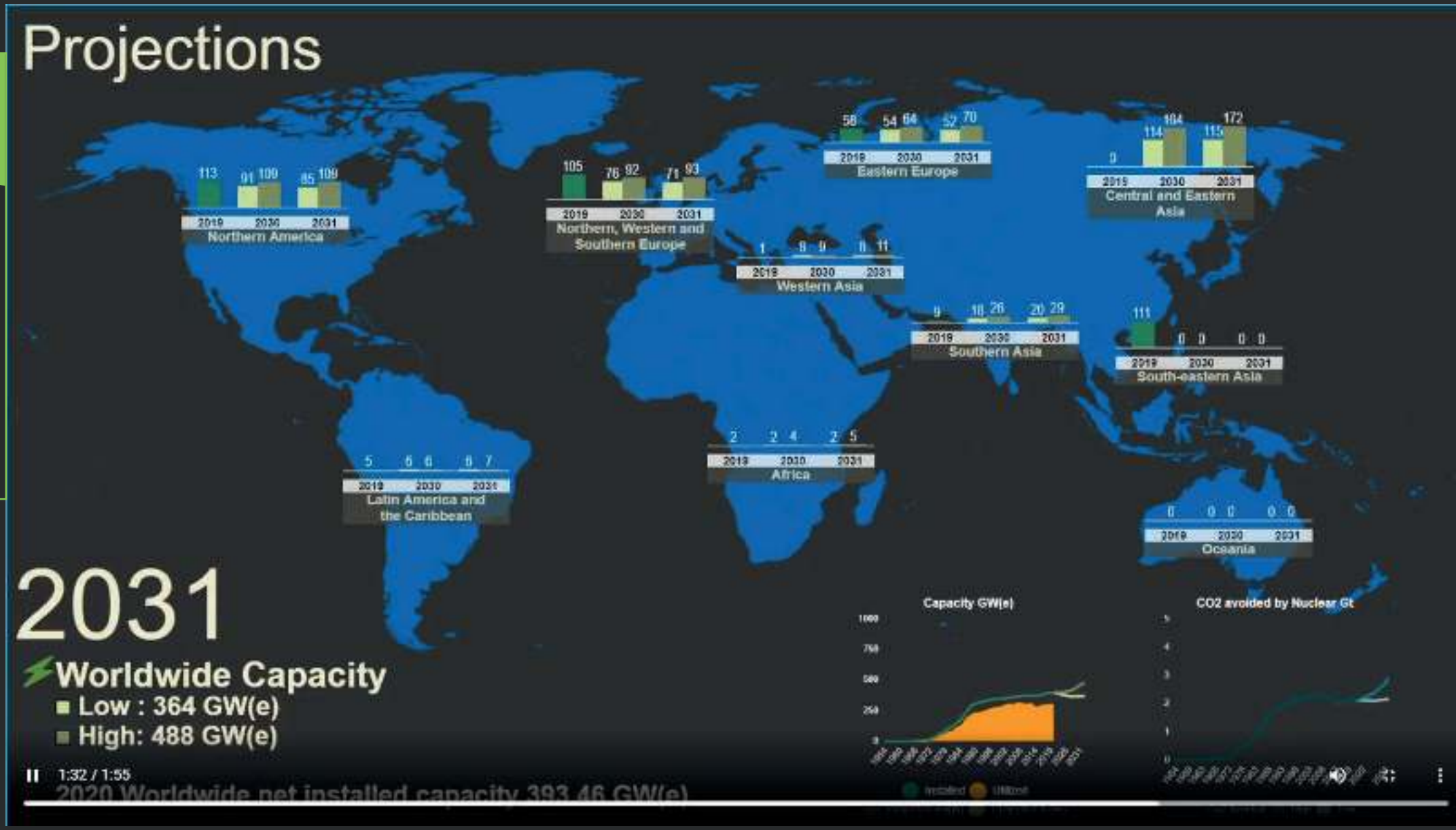
REGIONAL NUCLEAR POWER CAPACITY OVER TIME - MW(e)



AGE DISTRIBUTION OF OPERATIONAL CAPACITY

REGIONAL DISTRIBUTION OF NUCLEAR POWER

IAEA PRIS
www.iaea.org/pris



The IAEA projects that there will be five (5) nuclear reactors operating in Africa by 2031, up from the two (2) that currently are operational in South Africa.

CHAPTER TWO

SITUATIONAL ANALYSIS

2.1 CONTEXTUAL ANALYSIS OF ELECTRIC POWER

2.1.1 Global Power Situation

Global electricity consumption has continued to grow with year 2018 recording 22,964 TWh, a 3.5% increase from 22,190 TWh in 2017. The increase in global electricity consumption is attributed to factors such as increased urbanisation, increase in household incomes, electrification of transport and growing demand for digital connected devices. In 2018, world electricity generation increased to 26,589 TWh which was a 3.3% increase from 2017[1]. Combustible fuels were the major source of electricity generation which has led to increased pressure to adopt clean sources to reduce greenhouse gas emissions particularly carbon dioxide (CO_2). Figure 2 shows wor

ld gross electricity contribution by source in 2018[2].

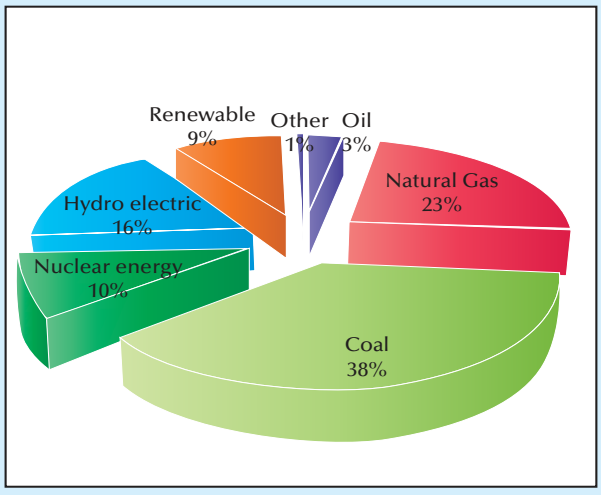


Figure 2: Global Electricity Generation Mix 2018

Given the environmental impact of the current energy mix, there has been a call for use of clean energy sources such as renewables and nuclear power. Consequently, global electricity supply from renewables increased by 14% in 2018. The adoption and use of nuclear power have also significantly increased with the global operating nuclear power capacity of 392.1 GW(e) as at 2019, comprising 443 nuclear power reactors operating in 30 countries. In addition, there were 54 reactors with a capacity of over 57.4 GW(e) under construction in 19 countries, four of which were building their first nuclear reactor3. Further, 255 reactors were in use for research, training, and production of medical and industrial isotopes in 55 countries4. By 2030, it is expected that 194 additional new reactors with capacity of 179 GW(e) will be connected to the grid.

In 2018, the world nuclear power generation was at 2,700 TWh which was 10% of the total electricity generated. Increased use of nuclear power has significantly reduced carbon dioxide (CO2) emissions by over 60 GW5 in the past 50 years. In addition, nuclear power generation cost is competitive compared to other forms of electricity generation. For instance, in 2017, nuclear energy averaged 0.4 Euro cents/KWh, much the same as hydro. Coal was over 4.0 Euro cents/KWh and gas ranged between 1.3 to 2.3 Euro cents/KWh in Europe. Only wind was lower than nuclear, at 0.1-0.2 Euro cents/KWh on average6.

1 Global Energy Statistical Yearbook 2019

2 BP Statistical Review: World Energy Report 2019 | 68th edition

3 IAEA Nuclear Power Status Report 2019

4 Minerals Council of Australia report 2019: Untapped Potential (There is More to Australian Mining)

5 International Energy Agency (IEA): Nuclear Power in a Clean Energy System Report 2019

6 World Nuclear Association: Nuclear Power Economics and Project Structuring 2017

2.1.2 African Power Situation

In 2018, electricity demand in Africa was 696 TWh an increase of 2.5% from 679 TWh in 2017. In the same period, electricity supply increased from 836 TWh to 855 TWh. Fast growing urban population in Africa is among the key factors that have led to an increase in electricity consumption. Consequently, Africa's demand and supply are expected to rise to about 2,300 TWh and 2,700 TWh by 2040 respectively[7]. By the end of 2018, about 600 million people (half of Africa's population) did not have access to electricity while around 80% of companies in Sub-Saharan African region suffered frequent power outages. In addition, more than 70% of the population (about 900 million people) did not have access to clean cooking source of energy. Further, 80% of electricity production in Africa in 2018 was based on fossil fuels (gas, coal and oil) as shown in Figure 3[8].

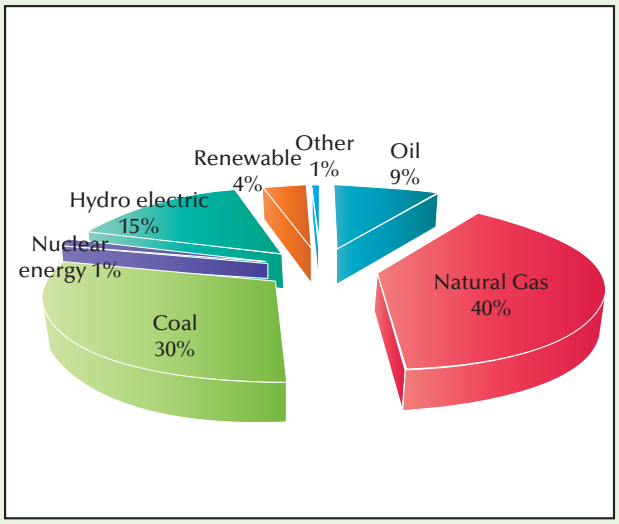


Figure 3: Africa Electricity Generation by Source in 2018

The need for clean energy has led to increase in demand for renewables and nuclear power generation in Africa. Currently, South Africa is the only country with a commercial nuclear power plant operating two reactors. Plans to build another nuclear power station are at advanced stage with an estimated cost of between R 400 billion (US$40 billion) and R1 trillion (US$100 billion)9.

Egypt is also at an advanced stage in its nuclear power programme at an estimated cost of US$60 billion including US$30 billion for the reactor construction. The construction is expected to be completed in FY 2026/27. Other countries such as Kenya, Nigeria, Morocco and Algeria are in the process of developing plans for nuclear energy generation.

2.1.3 Kenya Power Situation

Kenya's demand for electricity has been on an upward trend over the years owing to factors such as growing population, urbanization, intensive electrification programs, and continued growth in the manufacturing, agricultural and other sectors. Electricity demand stood at 8,769 GWh in 2018/19 financial year compared to 7,655 GWh in 2014/15 financial year, an average annual growth rate of 3.9%. The government is implementing the national transformation strategy, the Vision 2030 and the Big Four Agenda in which energy has been identified as a key enabler. With full implementation of the Vision 2030 projects, it is projected that electricity demand will increase at an average of 8.78% to 17,695GWh by 2024 and 63,341GWh by 2039.

The power generation mix comprises of geothermal, hydro, fossil fuels, wind and solar. The installed generation capacity over the past five years has risen from 2,299 MW in FY 2014/15 to 2,712 MW in FY 2018/19, representing an annual average growth rate of 4.52%. Figure 4 shows the electricity generation in Kenya by source in 2019[10].

7 International Atomic Energy Agency: Energy, Electricity And Nuclear Power Estimates For The Period Up To 2050

8 BP Statistical Review: World Energy Report 2019 | 68th edition

9 South African attitudes about nuclear power: The case of the nuclear energy expansion, January 2018

10 Ministry of Energy: Least Cost Power Development Plan (LCPDP) 2019-2039

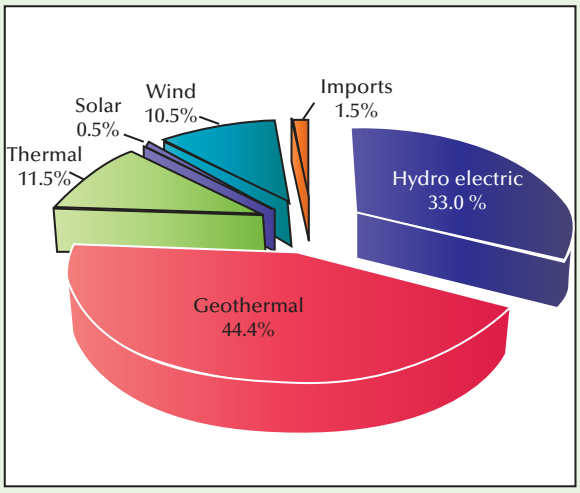


Figure 4: Kenya Electricity Generation Mix in 2018/19

There has been a decline in hydro generation from 32.74% in 2017/18 to 32.55% in 2018/19 mainly due to poor rainfall and changing climatic patterns. In addition, the government's deliberate policy to advance renewable energy generation led to a decline in thermal generation from 21.21% in 2017 to 11.29% as at June 2019. Further, as part of the low carbon energy generation strategy, the government through N*u*PEA is planning to start generation of nuclear power to supplement other sources of electricity. By 2035, the government expects to add 600 MW from nuclear power to the grid.

Development of a nuclear power station is expected to provide addition stable power, create jobs, develop skills and reduce CO2. However, nuclear power generation is faced with various challenges which include:

i. High initial capital outlay;
ii. Negative public perceptions on nuclear power plants;
iii. Long planning and development times;
iv. Nuclear liability;
v. Regulatory risks; and
vi. Fuel supply and waste management. An efficient spent fuel and waste management process is a key prerequisite.

Despite these challenges, there are opportunities which if fully exploited can enhance the growth of nuclear power generation. Some of these opportunities include:

i. Increasing demand of energy in Kenya and the neighbouring countries;
ii. The need for production of clean energy in order to reduce negative effects of greenhouse gas emissions on the environment;
iii. Relatively low cost/KWh;
iv. Reliable energy source as nuclear plants are designed to have long operating life (about 60 years); and
v. Operational reliability of nuclear power plants.

2.2 ENERGY SECTOR RESEARCH AND CAPACITY BUILDING

Sustainability of the energy and petroleum sectors necessitates well organized and structured research and capacity building for meaningful development. Sector research and capacity building depends, to a large extent, on the concerted and collaborative effort of all key stakeholders. Therefore, players such as the government, organizations within the sector, and research and academic institutions play a central role in the development and dissemination of sustainable energy programmes that address the needs of the industry and community11.

In Kenya, energy and petroleum sectors research and capacity building have been undertaken mainly individually by the various institutions in the sectors. To enhance research and human resource development, some of the institutions have set up research and/or training centers. Such centers include KenGen-Geothermal Training

11 Capacity Building for Sustainable Energy Development: The Role of the Academia Report 2019

Centre, KPLC-Institute of Energy Studies and Research, GDC- Geothermal Centre of Excellence, KPC-Morendat Institute of Oil and Gas.

However, challenges in the sectors' research and capacity building include:

i. Inadequate research, development and demonstration in the energy and petroleum sectors;

ii. Low funding for research and development;

iii. Inadequate promotion of local content development in the energy and petroleum sectors; and

i. Weak linkages between the energy and petroleum sector institutions and academia.

To address these challenges, N*u*PEA's mandate was expanded to include issues of research and development, and capacity building in the energy and petroleum sectors. In addition, the Ministry of Energy in the 2018 to 2022 strategic plan has planned specific initiatives including:

i. Development of a research and development institute;

ii. Strengthening collaboration on research, training, and technology modelling with learning institutions;

iii. Formulation of a national strategy for coordinating research in renewable energy;

iv. Capacity building for clean/renewable energy programme; and

v. Enhancement of the existing energy centres and establishment of new energy centres.

2.3 EVALUATION OF N*u*PEA'S PAST PERFORMANCE

N*u*PEA's past performance was evaluated based on the implementation of the 15-year strategic plan for nuclear power programme. The review was undertaken to establish achievements realized to date and identify unmet targets that need to be incorporated in the five-year Strategic Plan.

The 15-year roadmap identified 22 issues that need to be considered in development and management of national nuclear infrastructure. Some of the targets set in the strategic plan were:

i. Ensuring a comprehensive knowledge on nuclear power programme and government commitment to continue with its implementation;

ii. Provision of finance and the training of a significant workforce;

iii. Establishment of an independent nuclear regulatory body;

iv. Resolving issues of electricity network;

v. Establishment of national laws that meet international expectations and accession to international treaties and conventions;

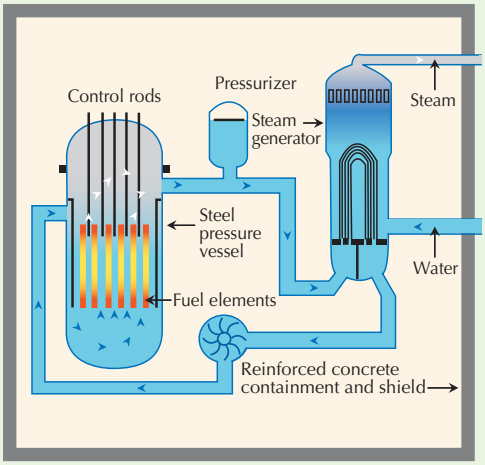
vi. Identification and substantiation of the proposed nuclear site; and

vii. Determination of safety approaches, future fuel supplies, waste management arrangements and spent fuel handling and storage.

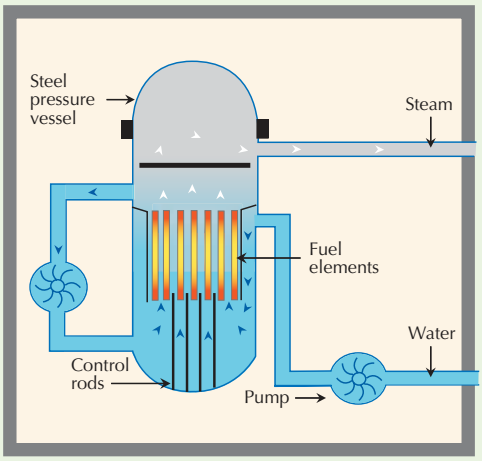
2.3.1 Achievements

Some of the key achievements during the implementation of the strategic plan under each of the 22 infrastructure issues are summarized in Table 2.

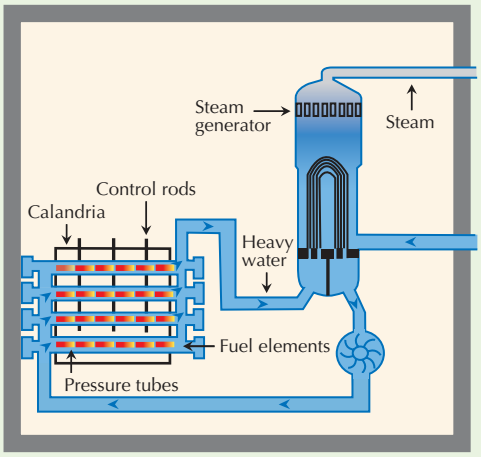
NUCLEAR POWER REACTOR DESIGN



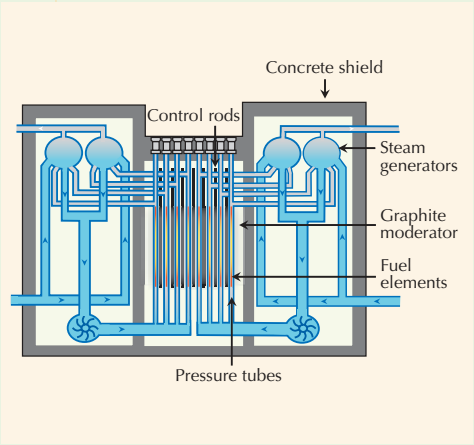
Pressurized water reactor (PWR)



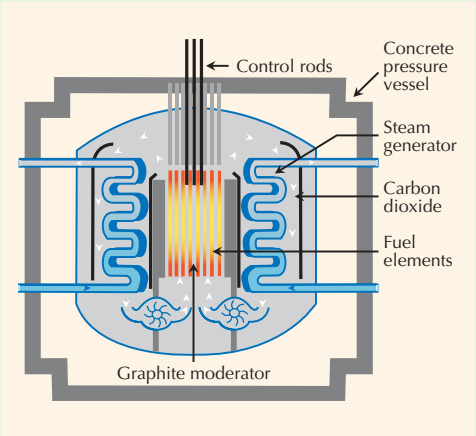
Boiling water reactor (BWR)



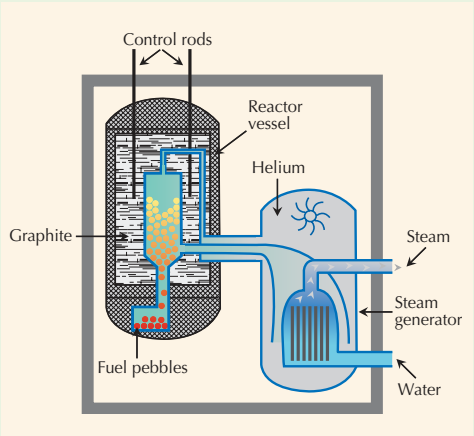
Pressurized heavy water reactor (PHWR/Candu)



Light water graphite-moderated reactor (LWGR/RBMK)



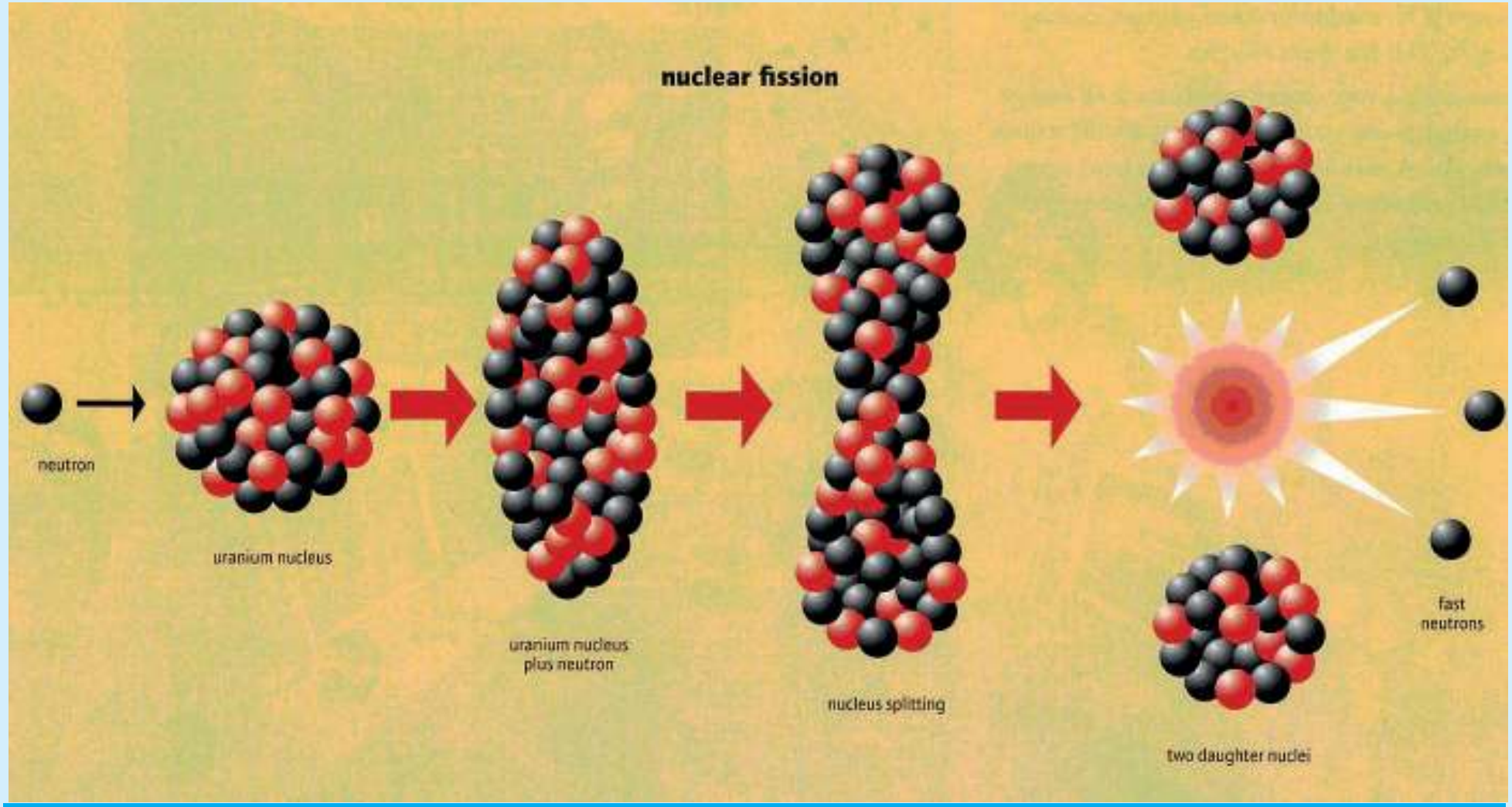
Advanced gas-cooled reactor (AGR)



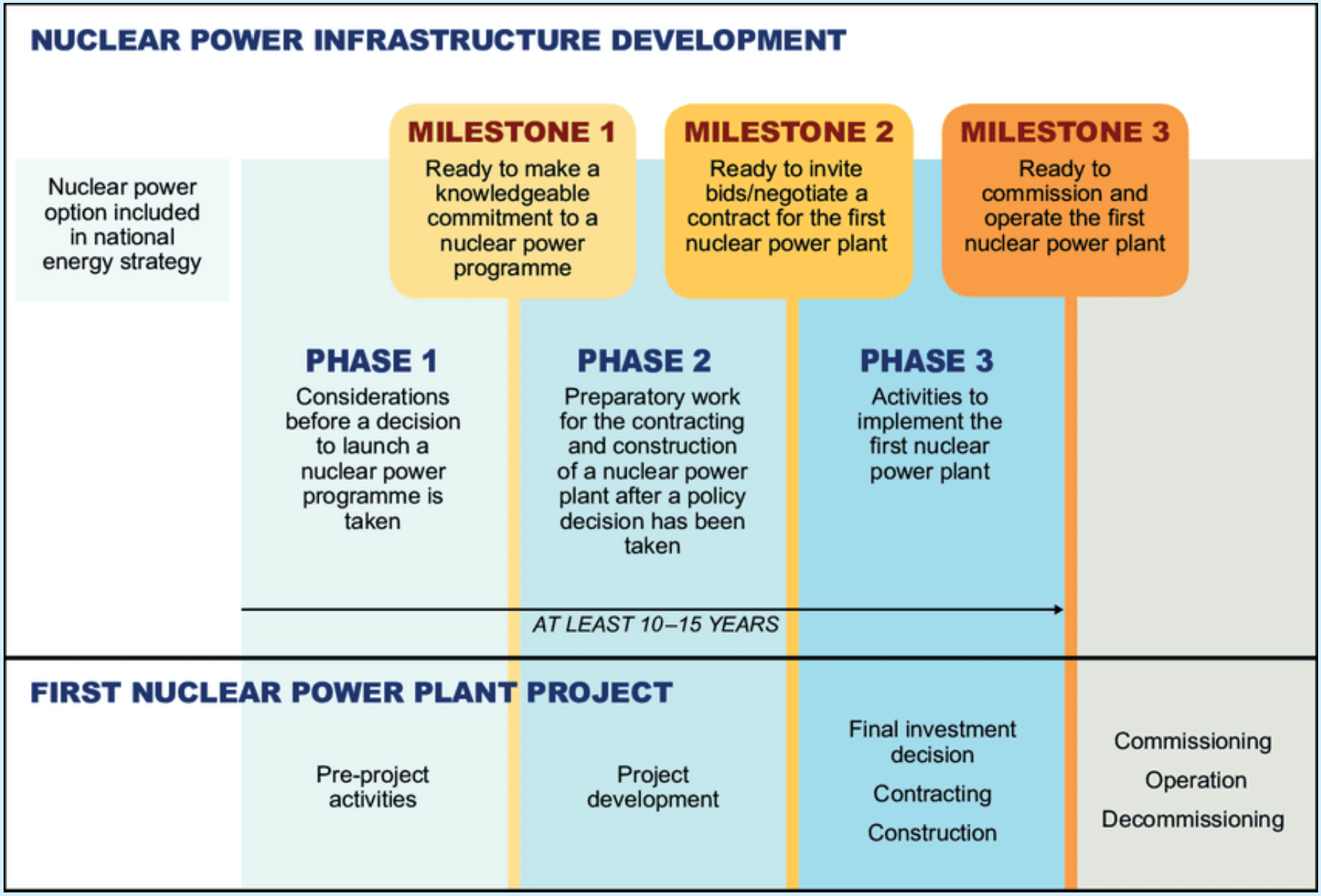
High-temperature reactor (HTR)

- In BWRs (boiling water reactors) and PWRs (pressurized water reactors), collectively known as LWRs (light water reactors), the light water (H2O) coolant is also the moderator.
- PHWRs (pressurized heavy water reactors) use heavy water (deuterium oxide, D2O) as moderator. Unlike LWRs, they have separate coolant and moderator circuits. Coolant may be light or heavy water.
- The chain reaction is controlled by the use of control rods, which are inserted into the reactor core either to slow or stop the reaction by absorbing neutrons.
- In the Candu PHWR, fuel bundles are arranged in pressure tubes, which are individually cooled. These pressure tubes are situated within a large tank called a calandria containing the heavy water moderator. Unlike LWRs, which use low enriched uranium, PHWRs use natural uranium fuel, or it may be slightly enriched. Candu reactors can be refuelled whilst on-line.
- A PWR generates steam indirectly: heat is transferred from the primary reactor coolant, which is kept liquid at high pressure, into a secondary circuit where steam is produced for the turbine.
- A BWR produces steam directly by boiling the water coolant. The steam is separated from the remaining water in steam separators positioned above the core, and passed to the turbines, then condensed and recycled.
- In GCRs (gas-cooled reactors) and AGRs (advanced gas-cooled reactors) carbon dioxide is used as the coolant and graphite as the moderator. Like heavy water, a graphite moderator allows natural uranium (in GCRs) or very low-enriched uranium (in AGRs) fuel to be used.
- The LWGR (light water graphite reactor) has enriched fuel in pressure tubes with the light water coolant. These are surrounded by the graphite moderator. More often referred to as the RBMK.
- In FBR (fast breeder reactor) types, the fuel is a mix of oxides of plutonium and uranium; no moderator is used. The core is usually surrounded by a 'fertile blanket' of uranium-238. Neutrons escaping the core are absorbed by the blanket, producing further plutonium, which is separated out during subsequent reprocessing for use as fuel. FBRs normally use liquid metal, such as sodium, as the coolant at low pressure.
- High temperature gas-cooled reactors (HTGRs), not yet in commercial operation, offer an alternative to conventional designs. They use graphite as the moderator and helium as the coolant. HTGRs have ceramic-coated fuel capable of handling temperatures exceeding 1600ºC and gain their efficiency by operating at temperatures of 700-950ºC. The helium can drive a gas turbine directly or be used to make steam.
- While the size of individual reactors is increasing to well over 1200 MWe, there is growing interest in small units down to about 10 MWe.

NUCLEAR FISSION



In nuclear fission a large nucleus is split into two medium-sized nuclei. Nuclear power plants currently in use depend primarily on the fission of uranium-235 and plutonium-239. When a nucleus of uranium-235 undergoes fission, it splits into two smaller atoms and, at the same time, releases neutrons (n) and energy. Some of these neutrons are absorbed by other atoms of uranium-235. In turn, these atoms split apart, releasing more energy and more neutrons. A chain reaction occurs when neutrons released in fission produce an additional fission in at least one further nucleus. This nucleus in turn produces neutrons, and the process repeats. The process may be controlled (nuclear power)



The IAEA Milestone Approach of Nuclear Power Infrastructure Development

Table 2: NuPEA's Key Achievements

Infrastructure Issue	Key Achievement(s)
1. National Position	i. Nuclear power safety, security and non-proliferation needs have been recognized and plans to ratify several conventions initiated. ii. A Cabinet memorandum on accession to nuclear safety conventions was prepared and key nuclear security conventions have been ratified. iii. Development and adoption of the National Energy Policy that formally introduces nuclear into the national energy mix. iv. Establishment of N*u*PEA through the Energy Act, 2019.
2. Security and Physical Protection	i. A Nuclear Security and Physical Protection Policy & Strategy has been developed and preliminary national threat assessment initiated. ii. The Nuclear Regulatory Act, 2019 has made provision for security and physical protection of nuclear material and facilities as well as radiation sources. iii. The status of nuclear security infrastructure has been evaluated. iv. The Government has acceded to several international instruments and adopted various United Nations security resolutions.
3. Nuclear Safety	i. The Government has initiated the process of acceding to the key nuclear safety conventions and signed various bilateral agreements. ii. Risk assessment for Nuclear Power Programme has been undertaken and mitigation measures identified.
4. Management	i. Competences for leadership and management in relation to Nuclear Power Programme is being conducted on a regular basis. ii. A Quality Management System (QMS) has been implemented.
5. Funding and Financing	A study on costs associated with developing the Nuclear Power Programme was undertaken, government identified as the initial source of funding and a technical working group has been established to analyze the funding and financing infrastructure issues.
6. Legislative Framework	The Government has acceded to the integral conventions in the areas of nuclear security and non-proliferation and enacted nuclear regulatory law.
7. Safeguards	A comparative review of safeguards approaches in various countries has been undertaken and recommendations made.
8. Radiation Protection	The Nuclear Regulatory Act, 2019 has introduced measures designed to enhance existing radiation protection requirements.
9. Regulatory Framework	i. Kenya Nuclear Regulatory Authority (KNRA) has been established through the Nuclear Regulatory Act, 2019. ii. Preliminary activities towards identifying resource requirements and competencies of the regulatory body have been initiated. iii. An Integrated Regulatory Review Service (IRRS) Mission has been conducted.
10. Electric Grid	The electric grid study was undertaken.
11. Human Resource Development	i. A Nuclear Power Human Resource Development Concept Model has been developed and studies conducted to identify the range of knowledge and skills that are necessary. ii. A Human Resource Development Strategy has been developed and sixty-two individuals have completed various training programmes on nuclear power plant technology. iii. A human resource database has been developed for those that have completed training in various nuclear related areas. iv. Nuclear knowledge sharing fora have been held on a regular basis.
12. Stakeholder Involvement	i. A comprehensive Communication Strategy has been developed and broad public education programme has been implemented. ii. A variety of informational, educational and communication materials have been developed and continuous public and stakeholder education activities undertaken.

Infrastructure Issue	Key Achievement(s)
13. Site and Supporting Facilities	i. A national Site Selection Team (SST) for nuclear installations was established and the criteria for siting of nuclear installations in Kenya developed. ii. A general survey of potential siting regions has been carried out and potential sites have been identified. iii. Screening and ranking of potential nuclear plant sites have been undertaken and preferred and alternate candidate sites identified iv. An IAEA Site & External Events Design (EPREV) Review Mission on site survey and site selection for Nuclear Power Plants in Kenya has been undertaken and preparatory activities for site assessment initiated.
14. Environmental Protection	i. A Strategic Environmental Assessment (SEA) has been conducted and the need for nuclear reactor projects to be subjected to an Environmental Impact Assessment (EIA) has been recognized. ii. Environmental Impact Assessment and Strategic Environmental Assessment Capacity building has been conducted and initial baseline environmental information collected and analyzed.
15. Emergency Planning	i. National emergency preparedness and response capability has been evaluated. ii. The EPREV Mission Action Plan is being implemented.
16. Nuclear Fuel Cycle	i. Assessment of suitable fuel cycle options for Kenya's Nuclear Power Programme has been undertaken and Nuclear Fuel Cycle Policy and Strategy have been developed. ii. User Requirements and Reactor Technology Assessment has been undertaken. iii. Evaluation of Nuclear Energy System Options has been conducted.
17. Radioactive Waste	i. Suitable radioactive waste management options have been evaluated. ii. A National Policy and Strategy for Radioactive Waste Management has been developed.
18. Industrial Involvement	The capability of local industries in Kenya to participate in the Nuclear Power Programme has been evaluated and a database to assess their capability developed.
19. Procurement	Requirements for purchasing nuclear power plant equipment and services have been identified and a Position Paper on procurement needs developed.
20. Nuclear Knowledge Management	i. Knowledge management policy developed. ii. Digital Nuclear Knowledge repository developed. iii. Nuclear knowledge library established.
21. Nuclear Research and Development	i. Nuclear Research and Development Policy and Strategy developed. ii. Justification report for Research Reactor in Kenya developed. iii. Kenya's Pre-Feasibility Study for Research Reactor Project has been undertaken. iv. Assessment of National Nuclear Infrastructure for the Research Reactor Project in Kenya has been carried out.
22. Internal and external environmental issues	An assessment of the risks associated with the nuclear power programme was carried out and an action plan to mitigate the identified risks developed.

2.3.2 Challenges

During the implementation of the Strategic Plan, the following challenges were encountered:

i. Budgetary constraints delayed implementation of some of the initiatives in the strategic plan;

ii. Delay in ratification of/accession to nuclear conventions delayed the implementation of

nuclear power programme;

iii. Inadequate staffing levels leading to reduced outputs;

iv. Inadequate infrastructure, equipment and office space leading to low productivity and efficiency;

v. Inadequate competency and human resource capacity in the nuclear field resulting into high cost of acquiring the expertise from other countries; and

vi. Low levels of awareness on nuclear energy technology among stakeholders resulting to spread of misinformation.

2.3.3 Lessons Learnt

N*u*PEA has identified the following areas for improvement which will enhance implementation of the five-year strategic plan:

i. Mobilization and diversification of resources will facilitate timely implementation of planned activities for the Nuclear Power Programme;

ii. Continuous involvement and participation of key stakeholders in the development of the Nuclear Power Programme will improve overall coordination of planned activities and forestall actual or potential conflicts that may arise;

iii. Well-coordinated execution of activities between various organizations involved in the development of the Nuclear Power Programme, including systematic and consistent sharing of information will improve the targeted completion rates of planned activities;

iv. Sustained engagement with the public will increase awareness and enhance understanding of the issues associated with utilization of nuclear technology and curb the spread of misinformation;

v. Reviewing and aligning guidelines and manuals for the Nuclear Power Programme in accordance with an Integrated Management System (IMS) will improve the interfaces between various processes and the actual realization of their respective outcomes;

vi. Developing infrastructure, and provision of adequate equipment and office space will lead to increased productivity and enhance efficiency;

vii. Developing framework(s) for risk management, knowledge management, and monitoring & evaluation will improve overall organizational performance and boost productivity; and

viii. Strengthening of staff capacity in management and leadership competencies, together with relevant nuclear fields, will support the realization of the Agency's mandate.

2.4 ENVIRONMENTAL SCANNING

In preparation of this Strategic Plan, N*u*PEA undertook an environmental scan aimed at determining the emerging issues that need to be addressed or taken into account during the plan period. The analysis was undertaken through Political, Economic, Socio-cultural, Technological, Ecological and Legal (PESTEL) and Strengths, Weaknesses, Opportunities and Threats (SWOT) models and the results are presented in Tables 3 and 4

.PESTEL Analysis

Factor	Aspect	Strategic Implication	Strategic Response
Political	• Changes in government policies	• Change in energy sector policies may boost or hamper the Agency in achieving its mandate	• Compliance with new policies and regulations • Sensitize and create awareness to political leaders on importance of the Nuclear Power Programme • Sensitize energy sector players on the role of the Agency in energy sector research and capacity building
Economic	• Inadequate national budgetary allocation	• Hamper the realization of the Agency's mandate • Disruption of planned activities	• Advocate for allocation of more resources • Diversify sources of funding • Seek technical and financial support from development partners
	• Large capital investment for nuclear power plant construction and energy and petroleum research and development	• Limited financing for nuclear power projects and energy and petroleum research & development • Increased costs arising from project implementation delays	• Develop strategies for attracting viable financing partners for nuclear power projects and energy and petroleum research & development and capacity building • Develop competence in project planning, monitoring and evaluation to mitigate cost overruns due to delays
	• Slow growth in electricity demand in the country	• Delay in implementation of the nuclear power programme	• Collaborate with energy sector entities in power planning and development to consider demand and supply factors impacting future energy growth projections
Social	• Increased literacy levels and information dissemination	• Enhanced positive perception and public approval of renewable energy sources and nuclear power • Encourage/discourage the progress of establishing the nuclear power programme • Civil actions from communities resisting implementation of nuclear energy projects	• Develop and implement a strategy for strengthening information sharing with the public on energy matters including benefits and risks of nuclear technology
	• Increased use of nuclear technologies in medical and other fields	• Demand for nuclear related technologies in medical and other fields	• Develop nuclear isotopes for use in medical and other fields

Factor	Aspect	Strategic Implication	Strategic Response
	• Natural calamities, pandemics and diseases such as floods, COVID-19	• Slow economic growth • Low demand for power • Reduced government funding	• Training staff and equipping them with protective materials • Collaboration with emergency response teams • Undertake corporate social responsibility programmes such as educating stakeholders on ways of dealing with pandemics and provision of protective materials/equipment
Technological	• Large and stable electricity supply network	• Enhances the safe performance of the national electricity grid for nuclear power plant operation	• Collaborate with key stakeholders such as KETRACO, KPLC and REREC to enhance supply network
	• Changes in nuclear power generation technologies	• Enhanced knowledge of different reactor technologies will result in strong technical competences such as the use of small and modular reactors (SMR)	• Comprehensive training and education for technical personnel with responsibility for the operation of the nuclear power programme
	• Rapid change in technologies	• Increased work efficiency • Enhanced access of key services by the public • Cost implications associated with adopting emerging ICT technologies • Technology becoming obsolete	• Upgrade information systems in line with emerging ICT technologies • Invest in scalable systems • Continuous training of staff on emerging technologies
	• Cyber-crime threats	• Cyber-attacks may lead to disruption of operations and loss of information	• Invest in information security systems • Continuous monitoring and strengthening of information system security
Environmental	• Safety and security concerns for NPP	• Resistance to establishment of NPP	• Dissemination of information to stakeholders • Ensure that a strong safety culture is established and maintained for the NPP • Build capacity for safe management and disposal of radioactive waste
	• Geological and meteorological considerations	• Potential geological and meteorological factors can affect the siting (location) of the nuclear power plant	• Assess the relevant geological and meteorological factors relevant to site selection

Factor	Aspect	Strategic Implication	Strategic Response
	• Climate change and global warming	• Support for clean energy such as renewable energy and nuclear power generation	• Promote utilization of green energy sources such as nuclear power and renewables to mitigate adverse effects of climate change
Legal	• Inadequate legal and regulatory framework for nuclear energy	• Poor regulation of nuclear power generation on areas such as safety and radiation protection	• Collaborate with institutions for enactment of laws and ratification of relevant international nuclear treaties and conventions • Operationalize the Energy Act,2019
	• Changes in legislations	• Cost of maintaining compliance	• Capacity building on new legislation • Ensure compliance with the new legislation
	• Litigation from communities	• Potential litigation may hamper nuclear power development	• Develop strategy to manage litigation risks
	• Overlapping mandates	• Lack of clarity on where responsibility lies	• Lobby for review of relevant Acts • Sensitize stakeholders on the Agency's mandate

Table 3: NuPEA PESTEL Analysis

2.4.1 SWOT ANALYSIS

Factor	Aspect	Strategic Implication	Strategic Response
Strengths	1. Establishment of N*u*PEA under the Energy Act,2019	• Statutory recognition of Kenya's Nuclear Power Programme	• Effective implementation of the Agency's mandate
	2. Competent and supportive Board	• Strategic leadership and oversight	• Continuous capacity building
	3. Highly skilled staff in some areas	• Capacity to deliver on the Agency's mandate	• Proper placement and utilization of employees • Competitive compensation for employees
	4. High staff retention	• Reduced costs and time of hiring and training • Increased productivity	• Continuous training and development • Implement good rewards and recognition system
	5. Relatively young workforce	• Adaptability and agility • Technical advancement and early adoption	• Offer development opportunities • Provide mentorship and feedback
Weaknesses	1. Insufficient financial resources	• Slow programme implementation	• Develop and implement a resource mobilization strategy
	2. Inadequate human resources	• Over reliance on external expertise	• Undertake specialized training and capacity building
	3. Inadequate publicity on nuclear issues	• Insufficient stakeholder support for the Nuclear Power Programme	• Implement a comprehensive public awareness/outreach strategy
	4. Inadequate equipment and office space	• Non-optimal working conditions	• Acquisition of adequate office space and equipment/tools
Opportunities	1. Synergistic alliances between industry and academia on matters relating to energy and petroleum R&D and innovation	• Coordinated energy and petroleum research, development and innovation	• Establish research coordination framework with industry and academia
	2. Income generation from commercialization and intellectual property management of energy technologies	• Increase in income generated	• Establish commercialization framework for intellectual property

	3. Designated National Liaison Office for the International Atomic Energy Agency	• Access to diverse technical support and assistance from IAEA	• Optimize utilization of support and assistance from IAEA
	4. Support from the international community	• Technical and financial support	• Implement MoUs in relevant areas
	5. Existing training institutes in the energy and petroleum sectors	• Availability of training infrastructure that can be utilised for capacity building	• Establish collaboration framework for energy and petroleum sectors training and capacity building
	6. Existence of local and international partners funding research and development	• Availability of resources for R&D	• Establish relevant collaborations and partnerships
	7. Establishment of a Consolidated Energy Fund	• Availability of additional resources	• Establish a framework to access and utilize the Consolidated Energy Fund
	8. Continued growth in demand for power in the country	• Need for increased power generation to meet the gap	• Fast track implementation of the nuclear power programme
	9. Enhanced nuclear security globally	• Increased safety and public confidence in NPP	• Comply with the measures put in place for nuclear power security
	10. Efficiency of nuclear energy such as cleanliness and environment friendly	• Public support for nuclear power as clean energy	• Enhance information dissemination • Implement the nuclear power programme • Adopt the laid down procedures
	11. Development of small and medium reactors (SMRs)	• Reduced capital outlay of nuclear power generation	• Adoption of SMRs technology
Threats	1. Negative perception and attitudes towards nuclear energy and technology	• Slowing/shelving of the Nuclear Power Programme	• Develop and implement public awareness and education strategy • Conduct public opinion surveys and engage stakeholders on a regular basis
	2. Slow pace in developing the legal and regulatory framework for nuclear energy	• Delay in implementation of the nuclear power programme	• Fast-track development of the legal and regulatory framework for nuclear energy
	3. Resistance from petroleum and other energy sector entities in relation to NuPEA's new mandate	• Conflict between energy sector entities resulting in delay in implementation of planned activities	• Promote cooperation between the energy sector entities • Create awareness of the Agency's mandate
	4. Inadequate public awareness of nuclear power issues	• Public disapproval of nuclear power generation in Kenya	• Enhance awareness creation

	5. Inability to absorb individuals who have been trained into the Nuclear Power Programme	• Loss of critical expertise and staff	• Develop a strategy to progressively absorb and retain individuals trained
	6. Competition on funding for conducting research with other energy and petroleum sector entities	• Inadequate resource allocations for optimizing research activities	• Develop coordinated research funding framework

Table 4: NuPEA SWOT Analysis

2.5 STAKEHOLDER ANALYSIS

In the development of the strategic plan, a stakeholder analysis was undertaken. N*u*PEA's stakeholders are identified in Table 5.

Stakeholder Category	Stakeholder Expectations	Strategies for Meeting Stakeholder Needs	N*u*PEA Expectations
1. National Government	• Compliance with policies, legislation and guidelines • Effective coordination of sectoral activities • Collaborations for technical and professional input • Information dissemination • Performance reporting • Efficient and accountable utilization of funds • Involvement in N*u*PEA activities	• Ensure compliance with policies, legislation and guidelines • Effective discharge of N*u*PEA mandate • Collaboration with the national government for technical and professional input • Effective resources utilisation • Sharing of information	• Adequate and timely funding of N*u*PEA's activities • Feedback from national government on N*u*PEA's progress • Support of N*u*PEA's mandate • Policy and legislative direction
2. County Governments	• Compliance with by-laws • Collaborations for technical and professional input • Information dissemination • Involvement in N*u*PEA activities	• Ensure compliance with existing by-laws • Enhance information sharing • Enhance collaboration with the county governments	• Participation in energy sector affairs • Support by County Governments • Regular and timely provision of relevant information and data
3. Nuclear and Energy sector regulatory bodies (KNRA and EPRA)	• Compliance with relevant laws and regulations in the energy sector • Information dissemination • Collaboration with N*u*PEA to ensure laws, regulations and guides are adhered to	• Ensure compliance with relevant laws and regulations in the energy sector • Enhance provision of information to the relevant regulatory bodies	• Guidance on compliance with relevant laws • Use of participatory approach in ensuring compliance by N*u*PEA • Collaboration in development of various regulations

Stakeholder Category	Stakeholder Expectations	Strategies for Meeting Stakeholder Needs	NuPEA Expectations
4. Other regulators/ government agencies such as NEMA, KRA, NRF, OAG, PPRA	• Compliance with relevant laws and regulations such as paying of taxes, environmental laws • Information dissemination	• Ensure laws, regulations and guidelines are adhered to • Ensure that the required information is shared on time	• Guidance on compliance with applicable laws • Use of participatory approaches in ensuring compliance by NuPEA
5. Institutions in the energy and petroleum sectors such as KenGen, KETRACO, REREC, KPLC, GDC, KPC, NOCK	• Participation in joint activities and projects in the sector • Collaboration in energy and petroleum sector research and capacity building • Consultation on energy matters • Information sharing • Participation in NuPEA activities that are cross-cutting in nature	• Enhance consultations and sharing of information on nuclear energy matters • Collaborate with energy and petroleum sector entities • Collaboration in carrying out R&D and capacity building in the energy and petroleum sectors	• Support NuPEA in implementation of its mandate • Cooperation in energy and petroleum sector research and capacity building • Sharing of information
6. International Atomic Energy Agency (IAEA)	• Cooperation and coordination of the country's nuclear technology activities • Information dissemination • Transparency and accountability in NuPEA operations • Adoption of nuclear industry best practices	• Adoption of best practices and guidelines recommended by IAEA in areas such as nuclear safety, security, safeguards, non-proliferation, accounting and control of nuclear materials • Ensure transparency and accountability	• Expert guidance on implementation of the Nuclear Power Programme • Support in capacity building initiatives for the Nuclear Power Programme • Provision of technical support in identified areas
7. Research and academic institutions	• Collaboration in research and development • Input in energy related and nuclear education programmes • Information dissemination • Sensitization on nuclear energy • Internships and attachments	• Collaborate with research institutions in conducting nuclear research • Enhance information sharing • Provision of internship & attachments opportunities to students	• Support for NuPEA's mandate • Collaborations in research and development • Provision of information on R&D
8. Suppliers	• Procurement opportunities • Transparency and fairness in procurement practices • Timely payments for provision of goods, works and services	• Comply with procurement laws • Share information promptly • Always be transparent and fair • Pay suppliers on time	• Quality goods, works & services • Adherence to procurement laws • Participate in tendering process • Timely delivery of goods, works and services
9. Potential nuclear power plant host communities	• Information dissemination • Consultations in implementation of the Nuclear Power Programme • Safe and secure environment	• Ensure that the communities are involved in key decision making affecting them • Ensure that their interests are safeguarded	• Participation in NuPEA's activities affecting host communities • Cooperation and support towards implementing NuPEA's mandate

Stakeholder Category	Stakeholder Expectations	Strategies for Meeting Stakeholder Needs	NuPEA Expectations
10. International community	• Involvement in Kenya's nuclear energy fora • Information dissemination • Consultation and collaborations on regional energy matters	• Participation in nuclear energy fora • Ensure that information is easily accessible • Ensure mutual collaborations in nuclear power generation and research	• Expert guidance on implementation of the Nuclear Power Programme • Support in capacity building initiatives for the Nuclear Power Programme • Participation in Kenya's nuclear energy dialogue/ fora
11. Development Partners	• Partnerships based on transparency and accountability • Information dissemination	• Good corporate governance and accountability • Timely reporting	• Financial and capacity building/ human resource development support • Participation in NuPEA's activities
12. Civil Society and NGOs	• Information dissemination • Involvement in NuPEA events	• Invite civil societies and NGOs to NuPEA events • Share information on nuclear energy generation	• Participation in NuPEA's events • Support and goodwill towards delivery of NuPEA's mandate
13. Professional Bodies	• Information dissemination • Registration of membership by NuPEA staff • Adherence to professional codes of conduct • Consultation on nuclear issues	• Provision of information • Quality products and services • Collaborations and consultations	• Participation in NuPEA's activities • Professional skill development of NuPEA staff
14. Media	• Involvement in NuPEA activities • Access to information • Sensitization on nuclear energy reporting • Partnerships with the media	• Provide relevant information • Promptly feedback on media information needs • Maintain good media relations	• Factual & accurate reporting of NuPEA's mandate and activities • Dissemination of information to the public • Participation in and coverage of NuPEA's events
15. Manufacturing and transport sector	• Affordable and reliable electricity • Information dissemination • Involvement in NuPEA's activities	• Sharing of nuclear power information through print media advertorials, radio and TV infomercials	• Participation in NuPEA's fora • Support towards implementation of NuPEA's mandate
16. General Public	• Affordable and reliable electricity • Safe and secure environment • Information dissemination • Transparency and accountability in NuPEA operations • Timely and prompt service delivery	• Ensure availability of low-cost energy • Sensitization of the public through print media advertorials, radio and TV infomercials, and Information, Education and Communication (IEC) materials • Being transparent and accountable	• Participation in NuPEA's public forums • Goodwill & support to facilitate implementation of NuPEA's mandate

Stakeholder Category	Stakeholder Expectations	Strategies for Meeting Stakeholder Needs	NuPEA Expectations
17. Board of Directors	• Timely implementation of approved policies • Effective and efficient delivery of services • Achievement of set targets • Continuous performance improvement	• Implementation of approved policies in time • Provision of efficient and high quality services • Continuously improvement of NuPEA's performance	• Strategic leadership and direction • Good governance • Support in resource mobilization
18. Staff	• Job security • Capacity building/skill development • Conducive work environment	• Provide good work environment • Continuous training and development of staff • Implement competitive remuneration structure	• Commitment to NuPEA's mandate • Achievement of set targets • Adherence to policies and legal provisions

Table 5: Key Stakeholders of NuPEA

The Hanbit Nuclear Power Plant in South Korea runs at an installed capacity of 5,875 MW. The power station is currently ranked as the fifth largest nuclear power station in the world. The plant's name was changed from Yeonggwang NPP to Hanbit in 2013 at the request of local fishermen

CHAPTER THREE

STRATEGIC DIRECTION

OUR VISION, MISSION STATEMENT

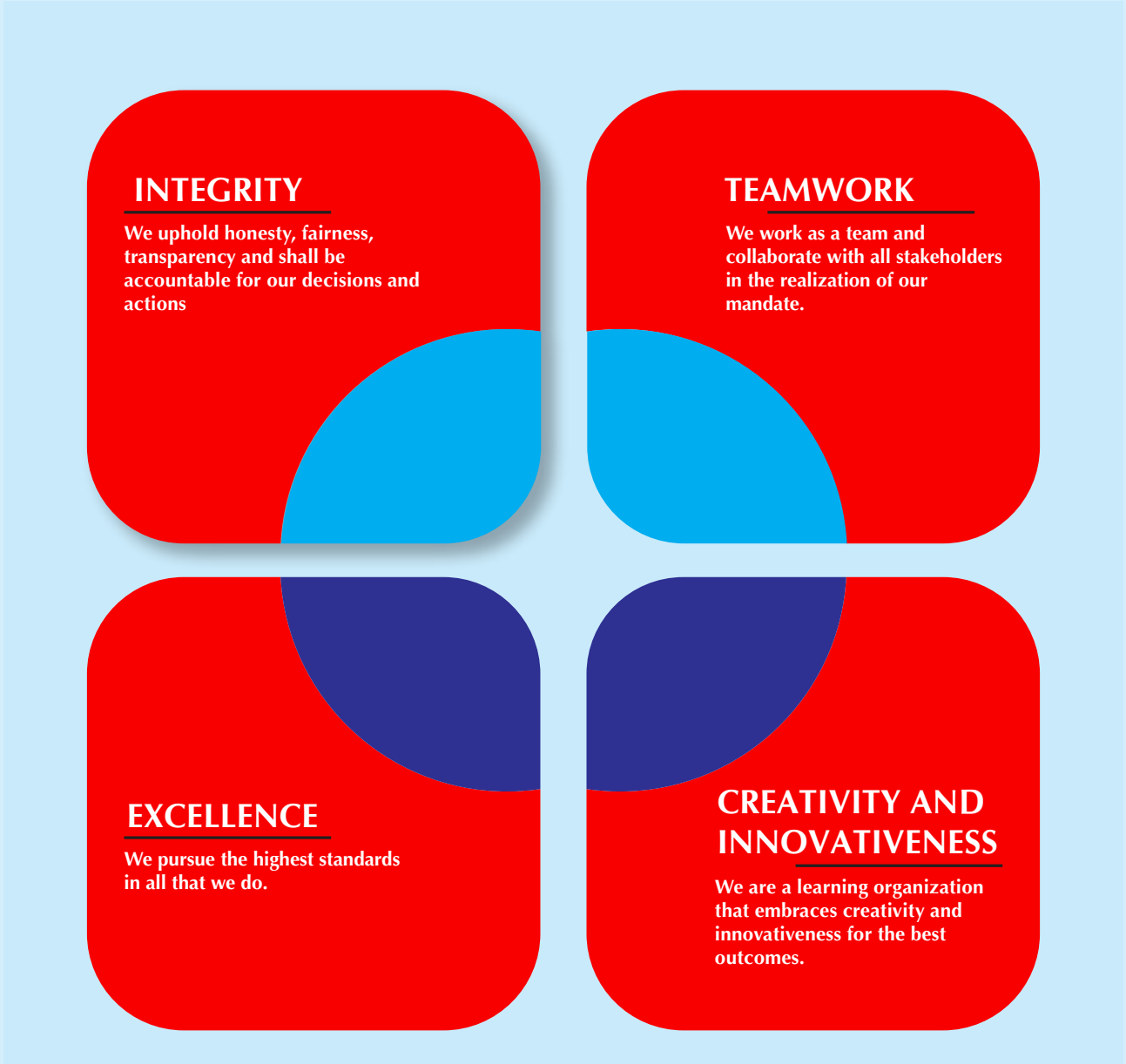
VISION

01 *A premier hub for nuclear power development and sustainable energy solutions*

To develop nuclear power, and undertake research and capacity building in the energy and petroleum sectors for socio-economic prosperity 02

MISSION

3.3 CORE VALUES



The Agency's core values acronym is I-TEC

3.4 KEY RESULT AREAS

Arising from the mandate, situational and strategic analysis, this strategic plan is based on five Key Result Areas (KRAs) namely:

1. Nuclear Energy Infrastructure Development;
2. Public Education and Stakeholder Engagement;
3. Energy Research and Development;
4. Energy Sector Capacity Building; and
5. Institutional Capacity.

3.4.1 Nuclear Energy Infrastructure Development

Introduction of nuclear power in Kenya's energy mix is a major undertaking. It requires the development of necessary infrastructures that will enable construction, operation, maintenance and decommissioning of the nuclear power plant and related amenities in a safe, secure and technically sound manner. In this regard, the 15-year roadmap for the Kenya Nuclear Power Programme identified 22 infrastructure issues which have to be addressed/developed to enable Kenya progress to the next phase of the nuclear power programme implementation. Development of the infrastructure will address among others policies, legislations, regulations, strategies, and organizational development of key institutions involved in the programme.

A feasibility study will form the basis of milestone achievement for the implementation of the Nuclear Power Programme. Towards this, N*u*PEA plans to conduct/finalise various technical studies that will inform the NPP site, grid interconnection schemes, human resource requirements, suitable reactor technology, localization, nuclear fuel cycle strategy and the financing option(s) to be adopted for the project. In addition, there is need to inculcate nuclear safety culture among the key stakeholders, propose amendments to the laws and regulations relevant to NPP and coordinate accession and domestication of international nuclear treaties and conventions.

3.4.2 Public Education and Stakeholder Engagement

Public Education and Stakeholder engagement forums aims to inform, sensitize, create awareness on nuclear power development and as a way of boosting understanding, enhance confidence and social acceptance of nuclear power

Stakeholder engagement, education and information sharing are the cornerstone for a successful nuclear power programme in any country. This calls for enhanced public education and stakeholder engagement with an aim of informing, sensitizing and creating awareness on nuclear energy development in Kenya as a way of boosting understanding, enhancing confidence and social acceptance, and support for Kenya's nuclear power programme.

With the additional mandate of research and development, and capacity building for the energy and petroleum sectors, there is need for establishment of strategic partnerships and collaborations in order to increase stakeholder's support and participation in energy and petroleum sectors research and capacity building. Through partnerships and collaborations, N*u*PEA will mobilize technical and financial support, enhance adoption of best practices and sharing of information. This will require an elaborate stakeholder engagement and management strategy.

Research Reactors are small nuclear reactors used for research, development, education and training. They produce neutrons for use in industry, medicine,agriculture and forensics, among others.

Kenya Vision 2030 has identified the need for reliable and affordable energy for the ever increasing commercial, industrial and household use. The Vision recognizes the critical role played by research and development (R&D), and innovation in accelerating economic development by raising productivity and efficiency. The Energy Act, 2019 identifies R&D as one of the necessary measures for realization of the energy and petroleum sectors' vision of clean, sustainable, affordable, reliable energy access for all Kenyans. Energy research and development will be necessary in enabling access to innovative energy solutions for socio-economic development. In order to participate in R&D there is need to develop research infrastructure, build human resource capacity and strengthen collaboration with local and international research and academic institutions.

Environmental concerns have led to a global move towards decarbonisation. This requires significant changes in the energy systems with a focus towards affordable, efficient, clean and sustainable energy technologies. Thus, increased R&D in all energy sources is required to accelerate adoption of these technologies. Towards this, N*u*PEA will develop the energy and petroleum sectors R&D coordination and implementation framework, foster collaborations and enhance funding for energy research. In addition, the Agency will enhance utilization of new technologies through dissemination of research outputs and commercialization.

3.4.4 Energy Sector Capacity Building

Kenya Students amongst the graduands from KEPCO International Nuclear Graduate School's Masters of Nuclear Power Plants Engineering

Successful development and deployment of energy systems is knowledge intensive and requires proper planning and implementation of human resource development. The Energy Act, 2019 recognizes capacity building as a key measure to ensure availability of knowledgeable and skilled human capital in the energy and petroleum sectors. To this end, N*u*PEA is spearheading the development of a coordination and implementation framework for capacity building in the energy and petroleum sectors.

Capacity building is resource intensive and there is therefore a need for N*u*PEA to lobby the government for allocation of the required resources. In addition, the Agency needs to mobilise resources from local, regional and international development partners.

3.4.5 Institutional Capacity

Good corporate governance is necessary to enable organizations operate more effectively, mitigate risk and safeguard stakeholders' interests. N*u*PEA plans to entrench good governance practices and strengthen enterprise risk management. In addition, the Agency will implement initiatives such as corporate branding and improve corporate communication with the aim of enhancing its corporate image.

Effective human capital management will enable the Agency to attract and retain skilled and motivated manpower which is critical for effective and efficient discharge of its mandate. To attract the requisite human capital N*u*PEA will implement appropriate human resource policies, build staff capacity and enhance performance management.

To achieve operational excellence, it is necessary for N*u*PEA to review its business processes and policies, and enhance automation. In addition, the Agency will entrench management systems through acquisition and maintenance of requisite ISO certifications. Further, N*u*PEA will strive to be financially sustainable by attracting adequate government budget allocation as well as funding from development partners.

3.4.6 STRATEGIC OBJECTIVES AND STRATEGIES

The strategic objectives and the respective strategies under each of the KRAs are captured in Table 6.

KRAs	Strategic Objectives	Strategies
1. **Nuclear Energy Infrastructure Development**	1.1. To ensure readiness of key nuclear power infrastructure	i. Finalisation of site selection and characterization
		ii. Accelerate NPP technology selection and appointment of an owner/operator
		iii. Establish an optimal solution for Nuclear Fuel Cycle (NFC) and Radioactive Waste Management (RWM)
		iv. Enhance regional and site-specific grid interconnection schemes for various NPP sizes
		v. Strengthen radiation protection
		vi. Enhance emergency preparedness and response
		vii. Develop an integrated approach to human resource development for the Nuclear Power Programme
		viii. Enhance local industry involvement in the NPP industry
		ix. Build procurement function capacity to deal with unique criteria associated with nuclear procurement
		x. Expedite determination of funding requirements, ownership and financing models for the nuclear power programme
		xi. Enhance informed national commitment
		xii. Enhance security and physical protection of nuclear facilities and nuclear material
	1.2. To have an adequate and supportive legal and regulatory framework	i. Review and propose amendment/enactment of national laws relevant to nuclear power programme
		ii. Coordinate the development of relevant policies necessary for implementation of nuclear energy programmes
		iii. Propose regulations to give effect to the legal framework for nuclear energy programmes
		iv. Coordinate accession and domestication of international nuclear treaties and conventions
		v. Strengthen State System of Accounting for and Control (SSAC) of Nuclear Material

NuScale; an integral pressurized-water reactor, designed by NuScale Power, LLC. The design is based on Multi-Application Small Light Water Reactor. NuScale is a natural circulation light water reactor with the reactor core and helical coil steam generators located in a common reactor vessel in a cylindrical steel containment. The reactor vessel containment module is submerged in water in the reactor building safety related pool, which is also the ultimate heat sink for the reactor. The pool portion of the reactor building is located below grade. The reactor building is designed to uphold 12 SMRs. Each NuScale SMR has a rated thermal output of 160 MWt and electrical output of 50 MWe, yielding a total capacity of 600 MWe for 12 SMRs.

KRAs	Strategic Objectives	Strategies
	1.3. To inculcate nuclear safety culture among the key stakeholders	i. Create awareness of nuclear safety among key stakeholders
		ii. Strengthen international and regional cooperation on matters of nuclear safety, security and safeguards (3S)
		iii. Enhance training of leaders and implementation of appropriate management systems (leadership and management for safety)
2. Public Education and Stakeholder Engagement	To increase stakeholder's awareness and support of N*u*PEA's mandate	i. Strengthen strategic partnerships and collaborations
		ii. Enhance information sharing and stakeholders' satisfaction
3. Energy Research and Development	3.1. To champion use of safe, efficient and sustainable energy systems	i. Enhance coordination of energy and petroleum research and development
		ii. Ensure availability of infrastructure for energy research and development
		iii. Facilitate implementation of nuclear research reactor project
		iv. Strengthen local and international cooperation in energy research
		v. Enhance funding of energy research and development
	3.2. To enhance uptake of new technologies and innovations in the energy and petroleum sectors	i. Enhance sharing of energy research outputs with the industry
		ii. Promote commercialization of energy research outputs
4. Capacity building in the energy and petroleum sectors	4.1. To ensure availability of skilled and competent human capital in the Energy and Petroleum sectors	i. Strengthen development of human capital in the Energy and Petroleum Sectors
		ii. Collaborate with education institutions offering energy and petroleum related programmes
		iii. Enhance knowledge management in the Energy and Petroleum Sectors
		iv. Enhance funding of capacity building in the Energy and Petroleum Sectors

KRAs	Strategic Objectives	Strategies
5. Institutional Capacity	5.1. To enhance good corporate governance	i. Adopt good corporate governance practices
		ii. Enhance Agency's risk management
	5.2. To promote a positive corporate image	i. Strengthen N*u*PEA's brand
		ii. Improve corporate communication
	5.3. To have a versatile, competent, highly performing and motivated workforce	i. Strengthen human capital management
		ii. Enhance staff capacity development
		iii. Adopt results-based performance management
		iv. Enhance employee welfare
	5.4. To enhance efficiency and effectiveness in service delivery	i. Enhance automation of operational processes
		ii. Acquire and maintain management systems (including ISO 9001 QMS, ISO 27001 based ISMS, and the IMS)
		iii. Enhance strategic plan implementation and M&E
	5.5. To enhance financial sustainability of the Agency	i. Strengthen the Agency's capabilities to attract increased government allocation
		ii. Attract funding from development partners
		iii. Enhance prudent management of financial resources

Table 6: KRAs, Strategic Objectives and Strategies

Each of the strategies has been operationalised in the implementation plan that is presented in Appendix II. For each strategy, the implementation plan details the activities, output indicators, targets, budget and responsibility.

Members of the National Assembly and Senate Energy Committees accompanied Board and Management of N*u*PEA to the Atom Expo 2019 in Sochi Russia.

CHAPTER FOUR

GOVERNANCE, RESOURCE REQUIREMENTS AND COORDINATION FRAMEWORK

4.1 GOVERNANCE AND ORGANIZATIONAL STRUCTURE

4.1.1 Board of Directors

As per Section 58 of the Energy Act, 2019, management of the Agency is vested in the Board of Directors which is responsible for overall leadership through provision of oversight and policy guidance. The functions of the Board as stipulated in Section 60 of the Energy Act, 2019 are to:

i. Manage, supervise and administer the assets of the Agency in such a manner as best promotes the purpose for which it is established;

ii. Determine the provisions to be made for capital, recurrent expenditure and reserves of the Agency;

iii. Receive any grants, gifts, donations or endowments on behalf of the Agency and make legitimate disbursements there from;

iv. Open a banking account or bank accounts for the funds of the Agency;

v. Approve the annual work plan including the short and long-term programs of the Agency; and

vi. Any other function that enhances or adds value to the proper performance of the Agency.

The Board has nine members with the CEO being an ex-official member. In line with Section 64 (1) of the Act and for effective discharge of its mandate, the Board has four standing committees namely:

a. Human Resource and Finance Committee;

b. Technical and Legal Committee;

c. Strategy and Research Committee; and

d. Audit Committee.

4.1.2 Chief Executive Officer

The Chief Executive Officer (CEO) has the responsibility of ensuring proper and efficient management of the day-to-day operations of N*u*PEA subject to the directions of the Board. The CEO is responsible for coordinating implementation, monitoring and evaluation of this strategic plan.

4.1.3 Organizational Structure

For effective and efficient implementation of the strategic plan, the Agency is organized in six directorates namely:

i. Directorate of Nuclear Energy Infrastructure Development;

ii. Directorate of Information Advocacy and Communication;

iii. Directorate of Energy Sector Research and Capacity Development;

iv. Directorate of Strategy and Planning;

v. Directorate of Legal & Regulatory Services and Company Secretary; and

vi. Directorate of Corporate Services.

Each directorate is headed by a Director who reports to the CEO. In addition, two departments namely Supply Chain Management and National Liaison Office reports directly to the CEO. Further, the Internal Audit department reports functionally to the Board and administratively to the CEO. The Agency's macro organogram is presented in Section 4.1.4. In order to enhance execution of its mandate, a regional office is to be established in the Coastal region during the plan period.

4.1.4 NuPEA Organogram

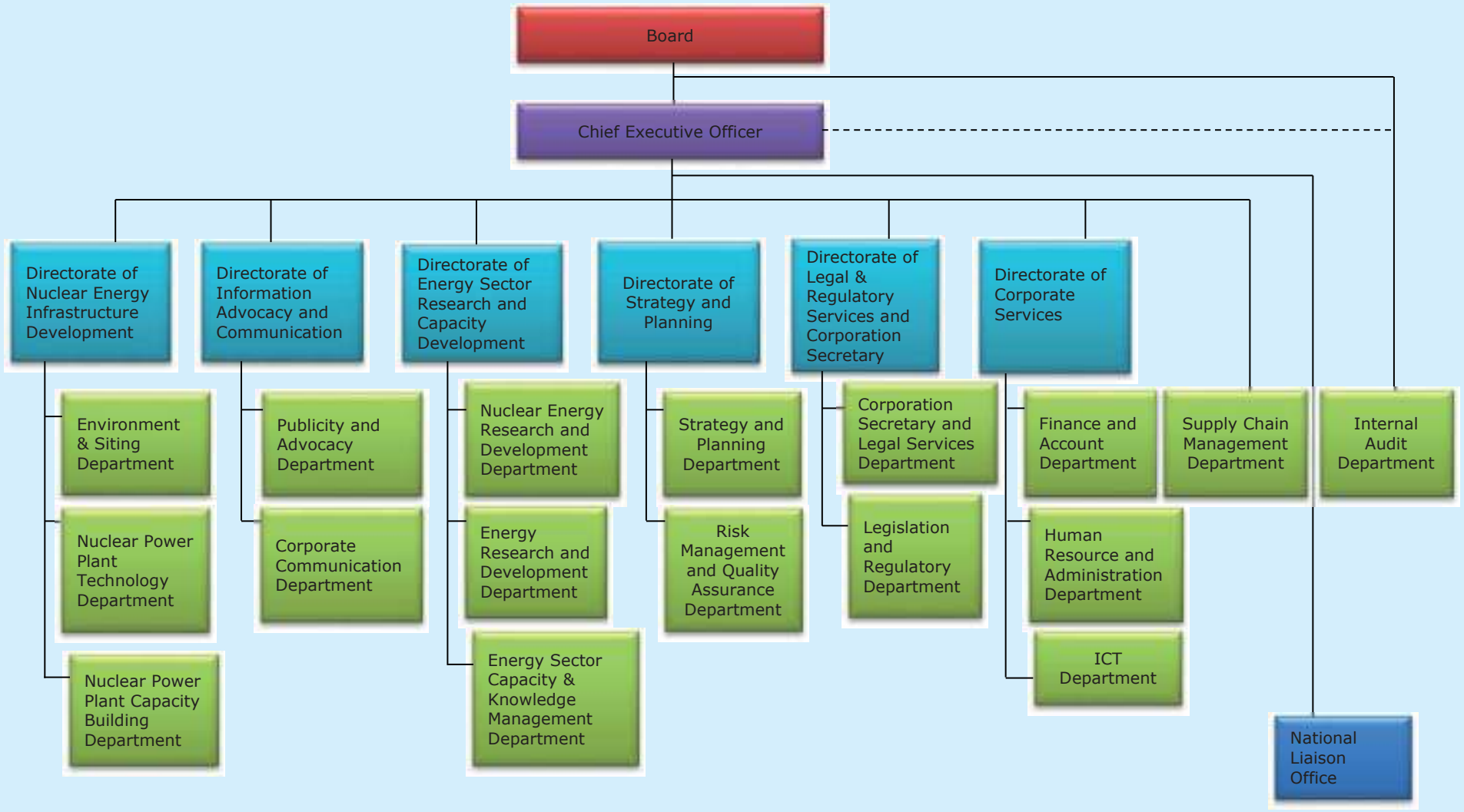


Figure 5: Agency's Macro Organogram

4.1.5 Staff Levels

Currently, the Agency has 79 employees against an approved staff establishment of 147. Table 7 provides the distribution of N*u*PEA staff. During the plan period, N*u*PEA's priority will be to maintain an optimal human resource capacity. To this end, the Agency will recruit staff with the requisite skills and experience. In addition, capacity building programmes will be launched in order to enhance staff skills and productivity.

Office	In-Post	Approved Staff Establishment
Chief Executive Officer	4	5
Directorate of Nuclear Energy Infrastructure Development	16	33
Directorate of Information Advocacy and Communication	10	21
Directorate Energy Sector Research & Capacity Development	2	22
Directorate of Legal & Regulatory Services and Corporation Secretary	6	14
Directorate of Strategy & Planning	5	12
Corporate Services Directorate	28	31
Supply Chain Management Department	4	5
National Liaison Office	2	
Internal Audit Department	2	4
Total	**79**	**147**

Table 7: NuPEA's Staff Levels

4.2 RESOURCE REQUIREMENTS

The Agency will require approximately Kshs 19.7 billion to implement the planned activities in the Strategic Plan and a recurrent budget of about Kshs 5.2 billion. The projected financial resource requirements for each of the strategic objectives and the recurrent budget are presented in Table 8.

KRAs	Strategic Objectives	Estimated Amounts (Kshs Million)					
		2020/21	2021/22	2022/23	2023/24	2024/25	Total
Nuclear Energy Infrastructure Development	To ensure readiness of key nuclear power infrastructure	540.1	1,430	1,176.60	1,067.50	703	**4,917.2**
	To have an adequate and supportive legal and regulatory framework	11	21.5	18.5	15	20	**86.0**
	To inculcate nuclear safety culture among the key stakeholders	2	13	15	26.5	38	**94.5**
Public Education and Stakeholder Engagement	To increase stakeholder's awareness and support of NuPEA's mandate	41.7	111.2	158.4	642.2	199.7	**1,153.2**
Energy Research and Development	To promote use of safe, efficient and sustainable energy systems	18	43	28	5,080	5,141	**10,310**
	To enhance uptake of new technologies and innovations in the energy and petroleum sectors.	0	5.5	15.5	7.5	7.5	**36.0**
Capacity building in the Energy Sector	To ensure availability of skilled and competent human capital in the Energy Sector	11.5	28.5	108.5	124.5	128.5	**401.5**
Institutional Capacity	To enhance good corporate governance	15.9	10.2	14.2	13.2	12.7	**66.2**
	To promote a positive corporate image	14.5	20	29.3	35	49.3	**148.1**
	To have a versatile, competent, highly performing and motivated workforce	194.5	112.3	170.5	109	78.5	**664.8**
	To enhance efficiency and effectiveness in service delivery	359.5	362.6	361	359	359	**1,801.1**
	To enhance financial sustainability of the Agency	4.6	1.6	1.6	1.6	1.6	**11.0**

KRAs	Strategic Objectives	Estimated Amounts (Kshs Million)					
		2020/21	2021/22	2022/23	2023/24	2024/25	Total
Sub-total		**1,213.30**	**2,159.40**	**2,097.10**	**7,481.00**	**6,738.80**	**19,689.60**
Recurrent Budget		539.5	836.1	972.8	1,233.10	1,616.90	5,198.40
Grand Total		**1,752.80**	**2,995.50**	**3,069.90**	**8,714.10**	**8,355.70**	**24,888.00**

KRAs	Strategic Objectives	Estimated Amounts (Kshs Million)					
		2020/21	2021/22	2022/23	2023/24	2024/25	Total
Nuclear Energy Infrastructure Development	To ensure readiness of key nuclear power infrastructure	540.1	1,430	1,176.60	1,067.50	703	**4,917.2**
	To have an adequate and supportive legal and regulatory framework	11	21.5	18.5	15	20	**86.0**
	To inculcate nuclear safety culture among the key stakeholders	2	13	15	26.5	38	**94.5**
Public Education and Stakeholder Engagement	To increase stakeholder's awareness and support of N*u*PEA's mandate	41.7	111.2	158.4	642.2	199.7	**1,153.2**
Energy Research and Development	To promote use of safe, efficient and sustainable energy systems	18	43	28	5,080	5,141	**10,310**
	To enhance uptake of new technologies and innovations in the energy and petroleum sectors.	0	5.5	15.5	7.5	7.5	**36.0**
Capacity building in the Energy Sector	To ensure availability of skilled and competent human capital in the Energy Sector	11.5	28.5	108.5	124.5	128.5	**401.5**

KRAs	Strategic Objectives	Estimated Amounts (Kshs Million)					
		2020/21	2021/22	2022/23	2023/24	2024/25	Total
Institutional Capacity	To enhance good corporate governance	15.9	10.2	14.2	13.2	12.7	**66.2**
	To promote a positive corporate image	14.5	20	29.3	35	49.3	**148.1**
	To have a versatile, competent, highly performing and motivated workforce	194.5	112.3	170.5	109	78.5	**664.8**
	To enhance efficiency and effectiveness in service delivery	359.5	362.6	361	359	359	**1,801.1**
	To enhance financial sustainability of the Agency	4.6	1.6	1.6	1.6	1.6	**11.0**
Sub-total		**1,213.30**	**2,159.40**	**2,097.10**	**7,481.00**	**6,738.80**	**19,689.60**
Recurrent Budget		539.5	836.1	972.8	1,233.10	1,616.90	5,198.40
Grand Total		**1,752.80**	**2,995.50**	**3,069.90**	**8,714.10**	**8,355.70**	**24,888.00**

Table 8: Projected Financial Resource Requirements

4.3 RESOURCE MOBILIZATION

The required financial resources for the implementation of this Plan will largely be drawn from the Government. Thus, the Agency will lobby the Government for allocation of the required resources. Resources from the Government will be complemented through:

a. Support from Development Partners

The Agency will seek technical and financial support from development partners. In this regard, N*u*PEA will develop funding proposals to development partners to support development of nuclear infrastructure, energy and petroleum sectors R&D and human capital development.

b. Resources from the Consolidated Energy Fund

Section 216 of the Energy Act, 2019 provides for establishment of a Consolidated Energy Fund. The Fund will be used to finance some of the activities being undertaken by the Agency. Consequently, there is need for the Agency to lobby for operationalisation of the Fund.

During the plan period, the Agency will implement measures to ensure effective and efficient use of available resources. These measures will include:

i. Streamlining business processes;

ii. Adoption of ICT in various processes;

iii. Budgeting and stringent financial discipline;

iv. Implementation of a robust performance management system;

v. Monitoring and evaluation of planned programmes/activities; and

vi. Adequate risk assessment and management.

4.4 COORDINATION AND RISK MANAGEMENT

4.4.1 Coordination Framework

Implementation of this Strategic Plan requires joint efforts of internal and external stakeholders. Thus, during the plan period, the Board of Directors will play a key role in formulation of the required policies, resource mobilisation, and monitoring and evaluation of the Strategic Plan implementation. The CEO will be responsible for overall coordination, implementation, monitoring and evaluation of this strategic plan. In addition, to enhance implementation of the plan, the CEO will be responsible for ensuring effective collaboration with key stakeholders. Heads of directorates will be responsible for ensuring effective and efficient implementation of planned programmes/activities within their functional areas.

To enhance strategic plan implementation, the Agency will:

i. Ensure effective communication of the plan to all staff and key stakeholders. This will ensure clarity of purpose and vision, and also enhance their support during strategy implementation;

ii. Enhance partnerships and collaborations with all stakeholders that are critical for successful implementation of the plan;

iii. Mobilise and avail resources for planned programmes and activities;

iv. Ensure annual work plans for directorates, departments, sections and individuals are aligned to the Strategic Plan;

v. Ensure performance contracting parameters are derived from the Strategic Plan;

vi. Strengthen organizational capacity to implement the Strategic Plan through recruitment of requisite staff and capacity building; and

vii. Continuously monitor implementation and undertake timely remedial actions.

4.4.2 Risk Management

The Agency will face various risks during implementation of this Strategic Plan. For successful implementation of the plan, these risks will have to be mitigated. Table 9 provides potential risks, likelihood of occurrence, level of impact on strategy implementation and mitigation measures.

A look into the spent fuel pool at Ignalina Nuclear Power Plant. The water-pool option involves storing spent fuel assemblies under at least 20 feet of water, which provides adequate shielding from the radiation for anyone near the pool. The assemblies are moved into the water pools from the reactor along the bottom of water canals, so that the spent fuel is always shielded to protect workers. About one-fourth to one-third of the total fuel load from the pools is spent and removed from the reactor every 12 to 18 months and replaced with fresh fuel.

Risk category	Risk Factor	Likelihood	Impact	Mitigation Measures
Political	i. Changes in laws and government policies	Medium	High	• Continuous monitoring of legal and regulatory environment • Participation in drafting of new regulations and policies • Compliance with new regulatory and policy framework • Continuous engagement with government and other key stakeholders
	ii. Some stakeholders may oppose some of the proposed programmes or activities	High	High	• Enhance public education and awareness • Effective stakeholder management • Seek effective collaborations and sharing of information
Financial	i. Inadequate funding	Medium	High	• Lobby for allocation of adequate resources from the government • Seek support from development partners • Lobby for operationalization of the Consolidated Energy Fund
	ii. Misappropriation of funds	Low	High	• Strengthen internal controls
	iii. Delays in disbursement of resources to programmes/ activities	Medium	High	• Strengthen budgeting and prudent use of funds • Synchronize work plans, budgets and procurement plans
Legal	i. Overlap of mandate	Medium	High	• Propose review of relevant Acts • Sensitize stakeholders on the Agency's role
	ii. Inadequate regulatory framework	High	High	• Propose review of relevant laws • Collaborate with the KNRA for timely enactment of regulations • Coordinate development of appropriate policies
	iii. Litigation	Medium	High	• Adequate representation in court cases • Ensure full compliance with applicable laws and regulations • Enhance public participation and stakeholder engagement

Risk category	Risk Factor	Likelihood	Impact	Mitigation Measures
Operational	i. Lack of requisite policies, procedures and systems	Low	High	• Develop requisite policies and procedures • Implement appropriate organizational systems
	ii. Weak monitoring, evaluation and reporting	Low	High	• Strengthen M, E & R for early detection and management of any risk • Implement a performance management system
Human	i. Inadequate staff capacity - number and skill mix	Medium	High	• Seek SCAC approval of new organization structure • Hire staff with requisite skills • Staff training and development
	ii. High staff turnover	Low	High	• Implement strategies that will facilitate retention of qualified and productive staff
	iii. Inadequate support of various initiatives	Low	High	• Cascade the strategic plan to staff • Effective communication and change management
Technological	i. Frequent changes in technology	Medium	High	• Implement scalable systems
	ii. Resistance to adoption of new technologies	Low	Medium	• Undertake staff training on new systems adopted by the Agency • Involvement of staff in selection of appropriate systems
	iii. Information security and cybercrime	Medium	High	• Continuous monitoring and strengthening of information system security • Cooperation and networking with stakeholders involved in cyber security space

Table 9: Potential Risks and Mitigation Measures

NuPEA strives to establish high-performance teams and an effective organizational structure that discovers talent and drives exceptional operational results to timely and efficiently deliver on the aspirations of this Strategic Plan.

CHAPTER FIVE

MONITORING, EVALUATION, REPORTING AND LEARNING

5.1 OBJECTIVES OF MONITORING, EVALUATION, REPORTING AND LEARNING

Accomplishment of the Agency's mandate is dependent upon successful implementation of this Strategic Plan. Consequently, the Agency will implement a Monitoring, Evaluation, Reporting and Learning (MERL) system that will track implementation of various strategies/activities against the set targets, measure the effectiveness of various interventions, provide timely performance feedback and initiate timely remedial action. In addition, the system will provide information on challenges experienced as well as lessons learnt. Further, the MERL system will facilitate sharing of information and support decision making.

5.2 MONITORING, EVALUATION, REPORTING AND LEARNING FRAMEWORK

Monitoring of the strategic plan implementation will be based on annual workplans and targets specified in the implementation matrix. In addition, monitoring will be undertaken at three levels namely Directorate, Management and Board level. The Agency's MERL framework will entail:

a. **Preparation and approval of annual workplans:** Heads of Directorates will ensure preparation and approval of annual workplans for each functional area as well as individual workplans at the start of every financial year. The annual workplan targets will be derived from the Agency's Strategic Plan.

b. **Linking of the MERL system to performance management system (PMS):** To enhance employees' performance appraisal, the Agency's MERL system will be linked to the PMS.

c. **Establishment of a MERL Committee:** A MERL Committee comprising of the CEO and heads of directorates will be established.

d. **Development of data collection tools/ templates:** The Directorate of Strategy and Planning will be responsible for development of performance data collection tools/templates. The directorate will also be responsible for building staff capacity on monitoring, evaluation and reporting.

e. **Monthly review meetings:** The MERL Committee will holding monthly meetings to review the implementation status of the strategic plan as it relates to each functional area.

f. **Quarterly progress reporting:** The MERL Committee will report on quarterly basis to the Board on the progress of the strategic plan implementation. Reports to the Board will include information on set targets, achievements and variances. The reports will also document challenges, lessons learnt and recommendations on appropriate remedial measures.

g. **Annual Review:** At the end of every financial year, an annual strategic plan implementation review meeting will be held. The meeting will take stock of the implementation status. The review findings will inform development of mechanisms of ensuring seamless implementation of the strategic plan.

h. **Mid-term review and evaluation:** A midterm review will be undertaken mid-way of the plan period (FY 2022/23) to evaluate implementation status and impact of various initiatives. Feedback will be used to incorporate changes in the objectives, strategies, activities among others based on new information regarding the Agency or the operating environment.

i. **End Term Evaluation:** This will be undertaken at the end of the plan period (FY2024/25) to review the success rate in the implementation of the strategic plan as well as impact of the implemented strategic initiatives. End term evaluation report will highlight key

milestones, challenges, lessons learnt and recommendations. The findings will inform the formulation of the next strategic plan.

Heads of Directorates will be responsible for implementation of the strategic plan activities as well as for provision of performance data and reports from their respective functional areas. The Director, Strategy and Planning will be responsible for implementation of the MERL system. The key performance indicators provided in Appendix III will provide guidance on more objective review of the progress of the strategic plan implementation.

APPENDICES

APPENDIX I: FUNCTIONS OF N*u*PEA

The specific functions of the Agency as stipulated in Section 56(2) of the Act are:

a. Propose policies and legislation necessary for the successful implementation of a nuclear power programme;

b. Undertake extensive public education and awareness on Kenya's nuclear power programme;

c. Identify, prepare and facilitate implementation of an approved roadmap for a nuclear power programme;

d. In collaboration with the relevant government agencies develop a comprehensive legal and regulatory framework for nuclear electricity generation in Kenya;

e. Develop a human resource capacity to ensure Kenya has the requisite manpower to successfully establish and maintain a nuclear power programme;

f. Identify appropriate sites in Kenya for the construction of nuclear power plants and their related amenities;

g. Enter into collaborative programmes with other countries, international and national organisations in relation to nuclear electricity research and development;

h. Identify a suitable operator for nuclear power plants;

i. Establish a well-stocked library and information centre on nuclear science and technology;

j. Promote local, regional and international participation in research activities, particularly in technology-oriented research;

k. Put in place mechanisms to attract private sector funding in research and human resource development for matters relating to energy;

l. Undertake a national research and human resource development road-mapping to assess the status of research in key energy technologies;

m. Promote local production of energy technologies;

n. Collaborate with institutions that collect, analyse and prepare policy papers in order to access energy sector specific information;

o. Enhance research linkages between industry and academia in matters relating to energy;

p. Continuously train and upgrade human resource capacity in the energy sector to keep up with the changing technological issues in collaboration with training institutions;

q. Advise on training curriculum and training needs targeting key areas in the energy sector;

r. Direct, monitor, conduct and implement energy research and technology development in all fields of energy;

s. Promote energy research and technology innovation;

t. Provide for—

u. training and development in the field of energy and petroleum, research and technology development; and

v. commercialization of energy technologies resulting from energy research and development programmes;

w. Register patents and intellectual property in its name resulting from its activities;

x. Authorize other persons for the use of its patents and intellectual property on such terms as the Agency may deem fit;

y. Publish its research findings and other research materials;

z. Establish facilities for the collection and dissemination of information in connection with research, development and innovation in the energy sector;

aa. Undertake any other energy technology development related activity as directed by the cabinet secretary;

ab. Collaborate with relevant training centres to ensure synergy in matters relating to energy;

ac. Promote relevant energy research through cooperation with any entity, institution or person equipped with the relevant skills and expertise;

ad. Make grants to educational and scientific institutions in aid of research in energy issues or for the establishment of facilities for such research;

ae. Promote the training of research workers in the energy sector by granting bursaries or grants-in-aid for research;

af. Undertake the investigations or research that the cabinet secretary, after consultation with relevant institutions, may assign to it;

ag. Advise the cabinet secretary on research in the field of energy technology;

ah. Create awareness and disseminate information on the efficient use of energy and its conservation; and

ai. Undertake any other functions as may be necessary for the execution of its mandate under this act.

APPENDIX II: IMPLEMENTATION MATRIX

KRA 1: NUCLEAR ENERGY INFRASTRUCTURE DEVELOPMENT

Strategic Objective 1.1: To Ensure Readiness of Key Nuclear Power Infrastructure

Strategies	Activities	Output indicator (s)	5-yr target	Annual Targets					Budget (M)						Responsibility
				Y1	Y2	Y3	Y4	Y5	Y1	Y2	Y3	Y4	Y5	Total	
Finalisation of site selection and characterization	Develop site selection and characterization implementation plan	Site selection and characterization implementation plan	1	1					1.5					1.5	DNEID
	Establish a NuPEA regional office at the Coast Region	Operationalised NuPEA Regional Office in Mombasa	100%	60%	40%				52.5	34.5				87	DNEID
	Review Terms of Reference (TORs) for site characterization	Approved TORs for site characterization	100%	70%	30%				4	2				6	DNEID
	Conduct site characterization for NPPs	Site characterization report	100%	13%	16%	31%	27%	13%	411	472	930	780	413	3006	DNEID, CEO
	Initiate harmonisation of environmental assessment regulation for nuclear power plants by the nuclear regulator and environmental Authority	EIA coordination framework for Nuclear Power Plants (Regulations on EIA for NPPs and/or Legal agreement on responsibilities of NEMA and KNRA)	100%	40%	60%				2	3				5	DNEID,
	Conduct Environmental Impact Assessment on the preferred site for the nuclear power plant	Approved EIA report that outlines the environmental management plan	100%	3.6%	5.5%	18.1%	36.4%	36.4%	2	3	10	20	20	55	DNEID
	Undertake acquisition of land at the best NPP sites	Land lease/title deed for the acquired land	100%	4%	84%	12%			40	820	120			980	DNEID

Strategies	Activities	Output indicator (s)	5-yr target	Annual Targets					Budget (M)						Responsibility
				Y1	Y2	Y3	Y4	Y5	Y1	Y2	Y3	Y4	Y5	Total	
Accelerate NPP technology selection and appointment of an owner/operator	Conduct Reactor Technology Assessment (RTA) and other energy options and their integration	Assessment report on the best SMR and large NPP for Kenya in comparison with other energy options	4		1	1	1	1		1	1	1	1	4	DNEID
	Develop assessment tools of evaluating technology infrastructure issues and vendor capability	Tools for RTA and vendor capability	100%		25%	25%	25%	25%		1.5	1.5	1.5	1.5	6	DNEID
	Acquire and undertake training on safety simulation tools for reactor technology	Percentage of staff trained on safety simulation tools for reactor technology	100%	25%	25%	25%	15%	10%	7	7	7	1.5	1.5	24	DNEID
	Develop specifications/requirements for nuclear power plant	Nuclear power plant specifications/requirements	100%	10%	15%	20%	25%	30%	1	1	4	5	6	17	DNEID
	Undertake vendor readiness assessment survey	Vendor readiness report	2		1		1			4		6		10	DNEID
	Conduct economic evaluation of reactor technologies	Report on economic evaluation of reactor technologies	2			1		1			4		6	10	DNEID
	Hold supplier symposium for Reactor Technology Providers (RTP)	No. of symposium held	2			1		1			5		5	10	DNEID
	Develop a documentation management system for RTA	E-Document management system for RTA in place	100%			20%	30%	50%			2	5	7	14	DNEID
	Undertake evaluation and appointment of NPP owner/operator	NPP operator evaluation report	100%		50%	50%				2	2			4	DNEID
		NPP operator in place	100%			20%	40%	40%			10	20	20	50	CEO

Strategies	Activities	Output indicator (s)	5-yr target	Annual Targets					Budget (M)						Responsibility
				Y1	Y2	Y3	Y4	Y5	Y1	Y2	Y3	Y4	Y5	Total	
Establish an optimal solution for Nuclear Fuel Cycle (NFC) and Radioactive Waste Management (RWM)	Undertake assessment of Kenya's potential in the front end of the NFC	Reports on Kenya's potential in the front-end NFC	2			1	1				2	4		6	DNEID
	Conduct an economic assessment of NFC and waste disposal options	Reports on various Economics of NFC and waste disposal options report	2		1	1				2	2			4	DNEID
	Undertake analysis of proliferation resistance of NFC technologies	Report on proliferation resistance of NFC technologies	1			1					2			2	DNEID
	Develop NFC policy and strategy	NFC policy and strategy	1	1					2					2	DNEID
	Conduct investigation on possible solution of the back end and waste management (for both storage and disposal)	Report on the optimal solution of the back end for the NFC and RWM (storage and disposal)	2			1	1					1	1	2	DNEID
	Coordinate appointment of radioactive waste management organization	Operational radioactive waste management organization in place	100%				50%	50%				10	10	20	DNEID
Enhance regional and site-specific grid interconnection schemes for various NPP sizes	Coordinate grid analysis for the best and alternate sites	Report on grid interconnection schemes for the best sites	100%	30%	40%	30%			3	4	3			10	DNEID
	Conduct an economic analysis for the grid system for the best and alternate sites	Updated economic analysis report for best and alternate site grid	100%			40%	30%	30%			3	2	2	7	DNEID

Strategies	Activities	Output indicator (s)	5-yr target	Annual Targets					Budget (M)						Responsibility
				Y1	Y2	Y3	Y4	Y5	Y1	Y2	Y3	Y4	Y5	Total	
	Acquire and train staff on the use PSS/E software	PSSE software licences	100%	100%					14					14	DNEID
		Percentage of employees trained on use of PSS/ E	100%	20%	20%	20%	20%	20%	3	5	5	5	5	23	DNEID
Strengthen radiation protection	Undertake analysis of additional hazards resulting from the introduction of NPP	Report on the additional hazards resulting from NPP	1	1					2.0					2.0	DNEID
	Identify radiation protection requirements for NPP based on IAEA Safety Standards	Report on the requirements for radiation protection	1	1					2.0					2.0	DNEID
	Identify and propose regulations and best practices needed for safe operation of NPP	A report outlining proposed regulations and practices for safe operation of NPP	1		1					3.0				3.0	DNEID
	Coordinate revision of the current radiation protection policy/ framework	A comprehensive radiation protection framework	1			1					5.0			5.0	DNEID
	Coordinate development of an action plan for implementation of the comprehensive radiation protection framework (CRPF) for NPPs	CRPF action plan	1				1					3.0		3.0	DNEID
Enhance emergency preparedness and response	Coordinate assessment of the country's emergency preparedness and response (EPR) framework	A status report on EPR	1			1					0.6			0.6	DNEID
	Undertake analysis of the emergency preparedness and response requirements for NPP	A report on resource requirements for an effective and efficient EPR	1					1					1	1	DNEID

Strategies	Activities	Output indicator (s)	5-yr target	Annual Targets					Budget (M)						Responsibility
				Y1	Y2	Y3	Y4	Y5	Y1	Y2	Y3	Y4	Y5	Total	
	Coordinate the IAEA EPREV Follow up Mission	A mission report on EPR arrangement for Kenya	1				1					2		2	DNEID
	Undertake capacity building on EPR	No. of people trained	8		2	2	2	2		1	1	1	1	4	DNEID
	Assess feasibility of emergency planning requirements for nuclear facilities and associated facilities	Report on the emergency plan requirements for nuclear facilities and associated facilities	1	1					1.6					1.6	DNEID
Develop an integrated approach to human resource development for the Nuclear Power Programme	Develop HRD strategy to address the gaps identified during assessment	HRD strategy for Nuclear Power Project	100%				40%	60%				7	8	15.0	DNEID
	Conduct an assessment of HRD requirements/needs for the Nuclear Power Project	A report on HRD requirement/needs for the Nuclear Power Project	100%	40%	60%				4	6				10	DNEID
	Undertake mapping of institutions that offer requisite trainings	List of local, regional and international training institutions	100%	50%	50%				3	3				6	DNEID
	Undertake a human resource competency gap assessment for the Nuclear Power Project	Human resource competency gap assessment (numbers and skill requirements) report	100%		20%	60%	20%			3	9	3		15	DNEID
Enhance local industry involvement in the NPP industry	Conduct local industry supply capability survey	Local industry capability survey report	100%	20%	70%	10%			6.5	50	1			57.5	DNEID
	Develop localization policy and strategy	Supply chain localization plan and strategy report	100%		40	60%				8	12			20	DNEID

Strategies	Activities	Output indicator (s)	5-yr target	Annual Targets					Budget (M)						Responsibility
				Y1	Y2	Y3	Y4	Y5	Y1	Y2	Y3	Y4	Y5	Total	
	Conduct a risk assessment for the local supply base	Risk Register /Matrix and Report	100%			20%	80%				2	3		5	DNEID
	Undertake capacity building for the local supply chain players	No. of supply chain players trained	15		2	4	4	5		2	4	4	5	15	DNEID
	Establish a management system in the project company	Management system for project company (Special Purpose Vehicle)	100%			20%	40%	40%			2	4	4	10	DNEID
Build procurement function capacity to deal with unique criteria associated with nuclear procurement	Review procurement policy to address unique aspects related to procurement of goods/services for NPP	A revised procurement policy (Nuclear procurement policy)	1			1			1	2	3	4		10	DNEID / PM
	Undertake manpower needs assessment for the procurement function	A report on procurement staff numbers and skill mix	1		1					3				3	DNEID / PM
	Undertake capacity building for procurement function	Number of procurement officers trained on procurement for NPP	10	3	2	5	5	5	3	2	5	5	5	20	DNEID / PM
Expedite determination of funding requirements, ownership structure and financing models for the nuclear power programme	Conduct a study on nuclear power infrastructure funding requirements	Report on Nuclear power infrastructure funding requirements	1	1					1					1	DS&P
	Conduct financial modelling for NPP and analyze ownership structure	Financing model report for NPP and ownership structure	1	1					5					5	DS&P

Strategies	Activities	Output indicator (s)	5-yr target	Annual Targets					Budget (M)						Responsibility
				Y1	Y2	Y3	Y4	Y5	Y1	Y2	Y3	Y4	Y5	Total	
Enhance Informed national commitment	Conduct a feasibility study for the Nuclear Power Programme	Feasibility study report	100%				40%	60%				140	160	300	DNEID
	Develop position paper on the role of nuclear power in decarbonization	Position paper on the role of nuclear power in decarbonization	1		1					3					DNEID
	Develop a comprehensive report for the Nuclear Power Programme	Nuclear Power Programme comprehensive reports	1				1					10		10	DNEID
Enhance security and physical protection of nuclear facilities and nuclear material	Identify and propose necessary regulations for security of nuclear facilities and nuclear material	Proposed nuclear security regulations	1		1					1				1	DNEID
	Define security requirements for selection of personnel required in construction and operation of a NPP	A report on security requirement for personnel in NPP construction and operation	1				1					1		1	DNEID
	Undertake capacity building on nuclear security and physical protection Design Basis Threat (DBT) development	No. of people trained	6			2	2	2			2	2	2	6	DNEID

Strategic Objective 1.2: To Have an Adequate and Supportive Legal and Regulatory Framework

Strategies	Activities	Output indicator (s)	5-yr target	Annual Targets					Budget (M)						Responsibility
				Y1	Y2	Y3	Y4	Y5	Y1	Y2	Y3	Y4	Y5	Total	
Review and propose amendment/enactment of National laws relevant to nuclear power programme	Review laws relevant to the Nuclear Power Programme and the Nuclear Regulatory Act 2019	Report on Laws to be reviewed and proposals for amendment / enactment made to stakeholders	1		1				1	2				3	DLRS&CS
		Number of laws or amendments drafted / laws enacted by Parliament	2			1		1		5	5	5	10	25	DLRS&CS
Coordinate development of relevant policies necessary for implementation of nuclear energy programmes	Develop the National Nuclear Policy covering all nuclear energy technology applications in the country	National Nuclear Policy developed and adopted	1		1				4	2				6	DLRS&CS
Propose regulations to give effect to the legal framework for nuclear power programme	Identify and propose necessary regulations & guidelines for NPP (in the areas of: - Site Evaluation - Radiation protection - Environmental protection and impact assessment - Nuclear Safety and Nuclear Safeguards	Report on regulations & guidelines for NPP to be developed	1		1					0.5	2.5			3	DLRS&CS
		Number of regulations drafted or enacted for implementation	4			2			2	4	4	4	4	16	DLRS&CS

Strategies	Activities	Output indicator (s)	5-yr target	Annual Targets					Budget (M)						Responsibility
				Y1	Y2	Y3	Y4	Y5	Y1	Y2	Y3	Y4	Y5	Total	
Coordinate accession of international nuclear treaties and conventions and compliance	Coordinate development of Cabinet memoranda on nuclear safety conventions to be acceded to	Number of international nuclear Safety treaties/ conventions acceded to	4		4				4	6				10	DLRS&CS
	Monitor, advise, and support compliance with international nuclear treaty obligations	Number of compliance report(s) filed with relevant agencies	2			1		1		2	2	1	1	6	DLRS&CS
		Level of compliance with international treaties	100%	100%	100%	100%	100%	100%							
Strengthen State System on Accounting for and Control (SSAC) of Nuclear Materials	Initiate implementation of the SQP rescission action plan	Report on implementation of the SQP rescission action plan	3			1	1	1			5	5	5	15	DNEID

Strategic Objective 1.3: To Inculcate Nuclear Safety Culture Among Key Stakeholders

Strategies	Activities	Output indicator (s)	5-yr target	Annual Targets					Budget (M)						Responsibility
				Y1	Y2	Y3	Y4	Y5	Y1	Y2	Y3	Y4	Y5	Total	
Create awareness of nuclear safety among key stakeholders	Undertake mapping of key local stakeholders	Stakeholder's mapping report	1		1					1				1	DIA&C
	Train key stakeholders on Nuclear safety	No. of stakeholders' representatives trained	12		3	3	3	3		2	2	2	2	8	NLO
		Training reports	4		1	1	1	1							
Strengthen international and regional cooperation on matters of nuclear safety, security and safeguards (3S)	Undertake mapping of various regional and international nuclear organizations	Report of regional and international organizations involved in nuclear safety	1		1					1				1	DNEID
	Enter into technical cooperation programmes with various regional and international nuclear organizations on nuclear safety	No. of MOU signed	3		1	1	1			0.5	0.5	0.5		1.5	DNEID
		Level of MOU implementation	100%			20	30	50			2	3	5	10	DNEID

Strategies	Activities	Output indicator (s)	5-yr target	Annual Targets					Budget (M)						Responsibility
				Y1	Y2	Y3	Y4	Y5	Y1	Y2	Y3	Y4	Y5	Total	
Enhance training of leaders and implementation of appropriate management systems (leadership and management for safety)	Develop leadership and management framework for nuclear safety	Framework on Leadership and management	1	1					2					2	DNEID
	Undertake leadership training for nuclear power programme stakeholder institutions	No. of leaders trained	10		2	2	4	4		1.5	1.5	3	3	9	NLO
	Develop and implement an Integrated management system (IMS) for the nuclear power programme	Development/acquisition of an integrated management system	100%		10%	20%	30%	40%		4	6	10	15	35	DS&P
		Level of implementation	50%				20%	30%				5	10	15	DS&P
	Undertake capacity building on an integrated management system	No. of persons trained	20		5	5	5	5		3	3	3	3	12	DS&P

KRA 2: PUBLIC EDUCATION AND STAKEHOLDER ENGAGEMENT

Strategic Objective 2.1: To Increase Stakeholder's Awareness and Support of N*u*PEA's Mandate

Strategies	Activities	Output indicator (s)	5-yr target	Annual Targets					Budget (M)						Responsibility
				Y1	Y2	Y3	Y4	Y5	Y1	Y2	Y3	Y4	Y5	Total	
Strengthen strategic partnerships and collaborations	Develop a partnership and collaboration policy	Partnership and collaboration policy	2		1			1		1			1	2	DLR&CS
	Undertake stakeholder mapping	Stakeholders mapping and classification report	3	1		1		1	0.2		0.2		0.2	.6	DIA&C
	Revise N*u*PEA Public Communication and Stakeholders' engagement strategy	Stakeholders' engagement strategy revised	3	1				1	0.3				0.3	.6	DIA&C
	Train staff on management of partnerships/ collaborations	No. of staff trained	4		1	1	1	1		1	1	1	1	4	DLR&CS
	Enter into MOUs with identified stakeholders	No. of MOUs	6	2	1	1	1	1	1	1	1	1	1	5	DLR&CS
		Level of MOU implementation	100%	100%	100%	100%	100%	100%							
Enhance information sharing and stakeholders' satisfaction	Implement public communication and stakeholders' engagement strategy	Level of implementation of public communication and stakeholders' engagement strategy	100%	20%	20%	20 %	20 %	20 %	5	5	5	5	5	25	DIA&C
	Establish Public Information centres	No. of Public Information centre operationalized	2			1	1		-	20	10	10		40	DIA&C
	Develop and implement a customer service delivery charter	Customer service delivery charter developed	2	1			1		0.2	0.2	0.2	0.2	0.2	1	DS&P

Strategies	Activities	Output indicator (s)	5-yr target	Annual Targets					Budget (M)						Responsibility
				Y1	Y2	Y3	Y4	Y5	Y1	Y2	Y3	Y4	Y5	Total	
		Level of adherence to customer service delivery charter	100%	100%	100%	100%	100%	100%							
	Develop and disseminate information, education and communication materials	Number of IEC materials developed and distributed	63,000	5000	8000	10000	15000	25000	8	15	30	35	40	128	DIA&C
	Engage stakeholders through meetings (seminars, workshops, conferences, & business platforms), exhibitions and Open days and partnership with professional bodies	Number of meetings held/facilitated.	200	20	30	40	50	60	4	20	30	40	50	148	DIA&C
	Conduct civic/public education on nuclear energy in Kenya's counties, including potential power plant host communities	Number of public education forums undertaken	120	10	20	30	30	30	10	25	35	35	35	140	DIA&C
	Deploy multimedia communication platforms (Radio and TV infomercials and programmes, documentaries, newspaper advertorials, social media, web-based advertising)	Number of multimedia communications held	100	10	15	25	25	30	12	20	40	500	60	182	DIA&C
	Undertake linkages with academia through holding career talks, essay writing contests, debates and support for science competitions	Number of academic linkages	30	4	6	6	6	8	1	3	6	6	6	22	DIA&C

Strategies	Activities	Output indicator (s)	5-yr target	Annual Targets					Budget (M)						Responsibility
				Y1	Y2	Y3	Y4	Y5	Y1	Y2	Y3	Y4	Y5	Total	
	Conduct a national public opinion survey every fourth year to gauge the level of public awareness on nuclear energy development	Number of national public opinion surveys held	1				1					9		9	DIA&C

KRA 2: ENERGY RESEARCH AND DEVELOPMENT

Strategic Objective 3.1: To Champion use of Safe, Efficient and Sustainable Energy Systems

Strategies	Activities	Output Indicator	5-yr target	Annual Targets					Budget (M)						Responsibility
				Y1	Y2	Y3	Y4	Y5	Y1	Y2	Y3	Y4	Y5	Total	
Enhance coordination of energy and petroleum research and development	Identify the legal/regulatory requirements to operationalize the Agency's research and development mandate	Report on legal / regulatory compliance requirements for energy research and development	100%	40	60				1	2				3	DLRS&CS
	Propose legal/regulatory provisions on research and development in consultation with energy and petroleum sectors organizations	Proposed legislation/regulations on energy research and development	1		1					6				6	DLRS&CS, DER&CD
	Develop and implement research and development coordination framework	Research and development coordination framework	100%	60	40				4	2				6	DER&CD
		Level of implementation	50%			10	15	25							
Ensure availability of infrastructure for energy research and development	Secure funds for the construction and equipping of energy research and development centre	Amount of funds mobilised	12.15B		50	100	6000	6000						0	DER&CD
	Acquire land for the construction of energy research and development centre	Land acquisition progress	100%		60	40			2	4	4	4	6	20	DER&CD
	Undertake construction of energy research and development centre	Energy research and development centre completion level	20%				10	10				50	100	150	DER&CD

Strategies	Activities	Output Indicator	5-yr target	Annual Targets					Budget (M)						Responsibility
				Y1	Y2	Y3	Y4	Y5	Y1	Y2	Y3	Y4	Y5	Total	
Facilitate implementation of nuclear research reactor (RR) project	Carry out feasibility study for the research reactor project	Feasibility Study report	1	1					7					7	DER&CD
	Develop nuclear research reactor infrastructure	Infrastructure development completion level	100%	20	20	20	20	20	2	2	2	2	2	10	DER&CD
	Carry out IAEA Integrated Nuclear Infrastructure Review - Research Reactor (INIR-RR) missions	INIR-RR Mission Report	1		1					5	2			7	DER&CD
		Action Plan Report for INIR	1			1									
	Develop bid invitation specification for a research reactor	RR Bid invitation specification	100%		70	30				5	3			8	DER&CD
	Acquire land for the construction of a research reactor	Land acquisition progress	100%	50	30	20				10	5	2		17	DER&CD
	Undertake construction of research reactor facility	Research reactor construction progress	40%				20	20				5000	5000	10,000	DER&CD
Strengthen local and international collaborations in energy research and development	Identify energy research and development thematic areas	Report on energy research thematic areas	2	1		1			1					1	DER&CD
	Map potential partners for collaborative research and technologies adaptation in the identified thematic areas	Report on potential partners in identified thematic areas	4		1	1	1	1						0	DER&CD
	Enter into research and/or technology adaptation MOUs with the identified partners	Number of MOUs signed and implemented	4		1	1	1	1						0	DER&CD
	Coordinate collaborative researches in the energy sector	Number of researches undertaken	3			1	1	1			10	20	30	60	DER&CD

Strategies	Activities	Output Indicator	5-yr target	Annual Targets					Budget (M)						Responsibility
				Y1	Y2	Y3	Y4	Y5	Y1	Y2	Y3	Y4	Y5	Total	
Enhance funding of energy research and development	Coordinate preparation of energy research and development funding strategy	Energy research and development funding strategy	1		1					6				6	DER&CD
	Coordinate mobilization of resources for energy research and development	Amount of funds mobilised	170M	20	20	40	40	50	1	1	2	2	3	9	DER&CD

Strategic Objective 3.2: To Enhance Uptake of New Technologies and Innovations in the Energy Sector

Strategies	Activities	Output Indicator	5-yr target	Annual Targets					Budget (M)						Responsibility
				Y1	Y2	Y3	Y4	Y5	Y1	Y2	Y3	Y4	Y5	Total	
Enhance sharing of energy research outputs with the industry	Coordinate preparation and implementation of energy research outputs dissemination framework	Energy research outputs dissemination framework progress	100%		20	20	30	30		2	2	2	2	8	DER&CD
	Organise and participate in local and international conferences, workshops and trade fairs	Number of conferences, workshops and trade fairs organised or participated in	10		2	2	3	3		3	3	5	5	16	DER&CD
	Publish energy research outputs on N*u*PEA's website	Number of researches published	7		1	2	2	2						0	DER&CD
	Support publication of research and development outputs	Number of researches published	4		1	1	1	1		0.5	0.5	0.5	0.5	2	DER&CD
Promote commercialization of energy research and development outputs	Develop and implement a strategy for managing intellectual property rights relating to energy research and development	Intellectual property rights strategy	1			1					6			6	DER&CD
		Number of energy innovations patented	2				1	1							
	Develop and implement energy research commercialization policy/strategy	Energy research commercialization policy/strategy	1			1					4			4	DER&CD

KRA 4: CAPACITY BUILDING IN THE ENERGY SECTOR

Strategic Objective 4.1: To Ensure Availability of Skilled and Competent Human Capital in the Energy Sector

Strategies	Activities	Output indicator (s)	5-yr target	Annual Targets					Budget (M)						Responsibility
				Y1	Y2	Y3	Y4	Y5	Y1	Y2	Y3	Y4	Y5	Total	
Strengthen development of human capital in the Energy and Petroleum sectors	Develop the sectors' capacity building coordination framework/ policy	Capacity building coordination framework/ policy	100%	60%	40%				4	2	2			8	DER&CD
	Coordinate capacity assessment of training institutes in the Energy and Petroleum sector	Report on training institutes' capacity assessment	1	1					3					3	DER&CD
	Coordinate re-engineering of sectors' training institutes	No. of training institutes re-engineered	100%			20%	30%	50%			20	25	35	80	DER&CD
	Coordinate development of HRD strategy for the sectors.	Energy and Petroleum sector HRD strategy	1		1					5				5	DER&CD
	Coordinate assessment of Human Resource Development (HRD) needs in the Energy and Petroleum sectors.	Report on Energy sector HR development needs	1	1					3					3	DER&CD
	Coordinate implementation of capacity building programmes.	Percentage of eligible staff trained	100%			20%	30%	50%			20	30	50	100	DER&CD
	Organize Sectors' conferences, workshops and seminars.	No. of conferences, workshops and seminars	5			1	2	2		3	5	8	10	26	DER&CD
		No. of participants	2500		200	500	800	1000							

Strategies	Activities	Output indicator (s)	5-yr target	Annual Targets					Budget (M)						Responsibility
				Y1	Y2	Y3	Y4	Y5	Y1	Y2	Y3	Y4	Y5	Total	
	Develop HRD monitoring and evaluation tools.	Energy and Petroleum sectors' HRD M&E framework and tools	100%		65%	35%					20	10		30	DER&CD
	Coordinate monitoring and evaluation of the sectors' training and development.	Monitoring and evaluation reports	3			1	1	1			2	2	2	6	DER&CD
	Administration of the Sectors' capacity building scholarships, bursaries and grants.	No. of scholarships, bursaries and grants awarded	30		3	7	10	10		7	15	20	20	62	DER&CD
Collaborate with education institutions offering energy and petroleum related programmes	Undertake mapping of public and private institutions of higher learning (universities and technical institutions) offering energy and petroleum related programmes.	Report on institutions offering energy and petroleum related courses	1		1					2				2	DER&CD
	Initiate and participate in institutions of higher learning curricula development/review	Participation in curricula review	6			2	2	2			2	2	2	6	DER&CD
	Enter into partnerships with institutions of higher learning and industries.	No. of MOU signed	7		1	2	2	2	0.5	0.5	0.5	0.5	0.5	2.5	DER&CD
Enhance knowledge management in the Energy and Petroleum sectors.	Develop the sectors' knowledge management policy.	Approved knowledge management policy	100%		60%	40%				3	2			5	DER&CD
	Develop a knowledge management system for the sectors.	Operational KM system in place	100%			20%	30%	50%			4	6	8	18	DER&CD

Strategies	Activities	Output indicator (s)	5-yr target	Annual Targets					Budget (M)						Responsibility
				Y1	Y2	Y3	Y4	Y5	Y1	Y2	Y3	Y4	Y5	Total	
	Train sectors' staff on the operations of the KM system.	Percentage of staff trained	100%			20%	30%	50%		5	10	15		30	DER&CD
	Implement and monitor knowledge management in the sectors.	Level of implementation of KM system	20%				10%	10%			5	5		10	DER&CD
Enhance funding of capacity building in the Energy and Petroleum sectors.	Coordinate determination of capacity building financial resource requirements for the sectors.	Capacity building financial resource requirements report	5	1	1	1	1	1	0.5	0.5	0.5	0.5	0.5	2.5	DER&CD
	Coordinate mobilization of resources for capacity building.	Amounts of resources availed/ mobilized for capacity building	100M	20	20	20	20	20	0.5	0.5	0.5	0.5	0.5	2.5	DER&CD

KRA 5: INSTITUTIONAL CAPACITY

Strategic objective 5.1: To Enhance Good Corporate Governance

Strategies	Activities	Output Indicator	5-yr target	Annual Targets					Budget (M)						Responsibility
				Y1	Y2	Y3	Y4	Y5	Y1	Y2	Y3	Y4	Y5	Total	
Adopt good governance practices	Develop and implement board and Board Committee charters	Approved board charter	1	1			1		3			3		6	BOD, DLRS&CS
		Level of implementation of Board Charter	100%	100%	100%	100%	100%	100%							
	Train the board and senior management on corporate governance	Number of board members and senior management trained	30	6	6	6	6	6	2	3	3	3	3	14	BOD, DLRS&CS
	Develop and implement board evaluation framework	Approved board evaluation framework	5	1	1	1	1	1	2	2	2	2	2	10	BOD, DLRS&CS
		Board evaluation reports	5	1	1	1	1	1							BOD
	Conduct legal and governance audits and implement recommendations	Legal and governance audits reports	3	1		1		1	4		4		4	12	DLRS&CS
		Level of legal and governance compliance	100%	100%	100%	100%	100%	100%							DLRS&CS
	Develop and implement anti-corruption policy and plan	Approved anti-corruption policy and plan	1												DLRS&CS

Strategies	Activities	Output Indicator	5-yr target	Annual Targets					Budget (M)						Responsibility
				Y1	Y2	Y3	Y4	Y5	Y1	Y2	Y3	Y4	Y5	Total	
		Level of adherence to the anti-corruption policy and plan	100%	100%	100%	100%	100%	100%	1	1	1	1	1	5	DLRS&CS
Enhance Agency's risk management	Review enterprise risk management (ERM) framework and business continuity plan	Approved ERM framework	2	1		1			1.5		1.5			3	DS&P
		Approved business continuity & disaster recovery plan	2		1			1		1.5		1.5		3	DS&P
	Train staff on ERM framework and business continuity plan	Training reports	5	1	1	1	1	1	1.2	1.2	1.2	1.2	1.2	6	DS&P
		% of staff trained	100%	100%	100%	100%	100%	100%							
	Implement the ERM framework and business continuity plan	Level of adherence to ERM framework and business continuity plan	100%	100%	100%	100%	100%	100%	1.2	1.5	1.5	1.5	1.5	7.2	DS&P

Strategic Objective 5.2: To Promote a Positive Corporate Image

Strategies	Activities	Output Indicator	5-yr target	Annual Targets					Budget (M)						Responsibility
				Y1	Y2	Y3	Y4	Y5	Y1	Y2	Y3	Y4	Y5	Total	
Strengthen NuPEA's brand	Undertake NuPEA branding	Approved brand manual	3	1		1		1	2		2		2	6	DIA&C
	Train staff on NuPEA brand image	% of staff trained	100%	100		100		100	2		2		2	6	DIA&C
	Develop and implement Corporate Social Responsibility Policy	Number of CSR activities implemented	15	3	3	3	3	3	5	5	5	5	5	25	DIA&C
		Number of beneficiaries	500	100	100	100	100	100							
Improve corporate communication	Review NuPEA's Public Communication strategy	Approved Public communication strategy	3	1		1		1	.5		.3		.3	1.1	DIA&C
	Implement NuPEA's Public communication strategy	Implementation rate of NuPEA Public communication strategy	100%	60%	40%	40%	60%	50%	5	15	20	30	40	110	DIA&C

Strategic objective 5.3: To Have a Versatile, Competent, Highly Performing and Motivated Workforce

Strategies	Activities	Output Indicator	5-yr Target	Annual Targets					Budget (M)						Responsibility
				Y1	Y2	Y3	Y4	Y5	Y1	Y2	Y3	Y4	Y5	Total	
Strengthen human capital management	Fastrack the approval of the organisation structure and staff establishment by SCAC	Approved organisation structure and staff establishment	1	1					1					1	MHRA

Strategies	Activities	Output Indicator	5-yr Target	Annual Targets					Budget (M)						Responsibility
				Y1	Y2	Y3	Y4	Y5	Y1	Y2	Y3	Y4	Y5	Total	
	Review of the organisation structure and staff establishment	Approved organisation structure and staff establishment	1				1					6		6	MHRA
	Fastrack approval of the reviewed job descriptions manual and career guidelines manual by SCAC	Revised career guidelines Manual and job descriptions manual	1	1					1					1	MHRA
	Review of job descriptions manual and career guidelines manual	Revised career guidelines Manual and job descriptions manual	1				1					10		10	MHRA
	Undertake job evaluation and salary review in line with the revised structure	Job evaluation and salary structure review report	2	1				1	1.5				1.5	3	MHRA
	Develop and implement staff recruitment plan	Staff recruitment plan	2	1			1		100	70	80			250	MHRA
		Number of staff recruited	70	30	20	20									
	Fastrack approval of the revised human resource policies manual by SCAC	Approved human resources policies manual	1	1					1					1	MHRA
	Review human resources policies manual in line with prevailing Government policies	Revised human resources policies manual	1				1					3		3	MHRA

Strategies	Activities	Output Indicator	5-yr Target	Annual Targets					Budget (M)						Responsibility
				Y1	Y2	Y3	Y4	Y5	Y1	Y2	Y3	Y4	Y5	Total	
	Mainstream cross cutting policies including Gender, ADA, HIV AIDS, Disability & GBV	Mainstreamed cross cutting policies including Gender, ADA, HIV AIDS, Disability & GBV	2	1			1		3			10		13	MHRA
	Develop and implement succession management plan and coaching & mentoring framework	Approved succession management plan and coaching & mentoring framework	4	2			2		2			3		5	MHRA
		Report on level of adherence to the succession management plan and coaching & mentoring framework	5	1	1	1	1	1							
Enhance staff capacity development	Finalize development of knowledge management strategy	Approved knowledge management strategy	1	1					1.5					1.5	MHRA
	Revise knowledge management strategy	Reviewed knowledge management strategy	1				1					3		3	MHRA
	Undertake staff training needs assessment	Staff training needs assessment report	5	1	1	1	1	1	0.5	0.5	0.5	0.5	0.5	2.5	MHRA
	Undertake human resource development needs assessment	Staff Human resource development needs assessment report	2	1		1			1		2			3	MHRA
	Develop and implement staff training plan	Staff training plan	5	1	1	1	1	1	30	40	50	60	70	250	MHRA
		% of staff trained	100%	100	100	100	100	100							

Strategies	Activities	Output Indicator	5-yr Target	Annual Targets					Budget (M)						Responsibility
				Y1	Y2	Y3	Y4	Y5	Y1	Y2	Y3	Y4	Y5	Total	
	Develop and implement Human resource development needs plan	Staff development plan	2	1		1			20		30			50	MHRA
		% of staff developed	100%	100%		100%									
	Carry out training and development impact assessment	Training and development impact report	5	1	1	1	1	1							MHRA
Adopt results-based performance management	Review performance management system	Approved performance management system	2	1		1									MHRA
	Train staff on the revised performance and reward management	% of staff trained on performance management system	100%	100		100			5		5			10	MHRA
	Implement performance management system	Staff performance evaluation reports	5	1	1	1	1	1							MHRA
Enhance employee welfare	Provide adequate office space	Additional office space for one hundred (100) staff approx. 12,500 sq.	1	1					20					20	MHRA
	Review and implement occupational safety and health policy	Approved occupational safety and health policy	2	1			1		1			3		4	MHRA
		Report on level of adherence	5	1	1	1	1	1							
	Sensitize staff on safety and health matters	% of staff sensitized	100%	100	100	100	100	100	0.5	0.8	1	1.5	1.5	5.3	MHRA

Strategies	Activities	Output Indicator	5-yr Target	Annual Targets					Budget (M)						Responsibility
				Y1	Y2	Y3	Y4	Y5	Y1	Y2	Y3	Y4	Y5	Total	
	Review staff welfare and benefits programme	Report on approved staff welfare	2	1			1		2.5			3		5.5	MHRA
	Implement revised staff welfare & benefits programme	Report on level of implementation	5	1	1	1	1	1							MHRA
	Carry out employees' satisfaction and work environment surveys	Employee satisfaction and work environment survey reports	2	1			1		2			3		5	MHRA
	Implement recommendations of employee and work environment surveys	Report on level of implementation of surveys recommendations	5	1	1	1	1	1	1	1	2	3	5	12	MHRA

Strategic Objective 5.4: To Enhance Efficiency and Effectiveness in Service Delivery

Strategies	Activities	Output Indicator	5-yr Target	Annual Targets					Budget (M)						Responsibility
				Y1	Y2	Y3	Y4	Y5	Y1	Y2	Y3	Y4	Y5	Total	
Enhance automation of operational processes	Undertake ICT needs assessment	ICT needs assessment report	5	1	1	1	1	1	0	0	0	0	0	0	MICT
	Acquire, install and maintain recommended ICT hardware and software	Hardware and software acquired, installed and maintained.	100%	20	20	20	20	20	200	200	200	200	200	1,000	MICT
		Annual maintenance schedule report of hardware and software acquired.	5	1	1	1	1	1	0	0	0	0	0	0	MICT
	Train staff on installed ICT systems	% of requisite staff trained	100%	100%	100%	100%	100%	100%	1	1	1	1	1	5.0	MICT
		Level of utilization of installed systems	100%	100%	100%	100%	100%	100%	0	0	0	0	0	0	MICT
	Automation of operational processes	Automation level Reports	5	1	1	1	1	1	0.2	0.2	0.2	0.2	0.2	1.0	MICT
		Level of automation in the Agency	100%	55%	60%	70%	80%	100%	70	70	70	70	70	350	MICT
	Adoption and implementation of Enterprise Resource Planning (ERP)	Level of ERP implementation	100%	30%	60%	100%			60	120	120			300	MICT
	ICT infrastructural development	LAN/WIFI upgrade	100%	70%	75%	80%	85%	100%	15	15	15	15	15	75	MICT
		Bandwidth1 increment (Mbps)	100%	100	150	200	250	300							

Strategies	Activities	Output Indicator	5-yr Target	Annual Targets					Budget (M)						Responsibility
				Y1	Y2	Y3	Y4	Y5	Y1	Y2	Y3	Y4	Y5	Total	
		% of obsolete equipment replaced with new ones	100%	20	20	20	20	20							
		Redesigned website	100%	100%											
	Improve the security of the Agencies data and information	Data recovery centre implementation level	100%	20%	40%	60%	80%	100%	10	10	10	10	10	50	MICT
Acquire and maintain management systems (including ISO 9001 QMS, ISO 27001 based ISMS, and the IMS)	Engage ISO auditors for auditing of operating procedures	No. of ISO audits reports	5	1	1	1	1	1	0.5	0.5	0.5	0.5	0.5	2.5	DS&P
	Apply for ISMS 27001 and IMS certifications	ISO certifications acquired	2	1	1				0.8	0.8				1.6	DS&P
	Adhere to requirements of the certifications	Level of adherence	100%	100	100	100	100	100	2	0.5	0.5	0.5	0.5	4.0	DS&P
	Carry out continuous improvement of operational processes	Operational processes reviews	100%	20	20	20	20	20		0.6	0.8	0.8	0.8	3.0	DS&P

Strategies	Activities	Output Indicator	5-yr Target	Annual Targets					Budget (M)						Responsibility
				Y1	Y2	Y3	Y4	Y5	Y1	Y2	Y3	Y4	Y5	Total	
Enhance strategic plan implementation and M&E	Align annual performance contracts with the strategic plan	Level of alignment of annual performance contracts and the strategic plan	100%	100	100	100	100	100		4	3	1	1	9	DS&P
	Develop departmental annual work plans and budgets in line with the strategic plan	Departmental annual work plans and budgets aligned with the strategic plan	100%	100%	100%	100%	100%	100%							DS&P
	Monitor implementation of work plans and prepare quarterly status report	Monitoring and evaluation reports	20	4	4	4	4	4							DS&P
		Level of implementation	100%	100%	100%	100%	100%	100%							DS&P
	Carry out mid-term review of the Strategic Plan	Revised Strategic Plan	1			1									DS&P

Strategic objective 5.5: To Enhance Financial Sustainability of the Agency

Strategies	Activities	Output Indicator	5-yr Target	Annual Targets					Budget (M)						Responsibility
				Y1	Y2	Y3	Y4	Y5	Y1	Y2	Y3	Y4	Y5	Total	
Enhance resource mobilization	Identify and prepare comprehensive concept papers for fundable projects	Number of projects funded	3 new projects funded			1	1	1							MF&A, DNEID, DS&P, DER&CD
	Lobby the Government for project funding	Increased level of funding	50%	-	15%	10%	10%	15%							MF&A

Attract funding from development partners	Undertake mapping of development partners	Report on development partners mapping	1	1											MF&A, DNEID, DS&P, DER&CD
	Develop and present proposals for funding	Number of funding proposals developed	5	1	1	2	1		0.6	0.6	0.6	0.6	0.6	3	
		Amount of funds secured	50	8	9	10	11	12							
Enhance prudent management of financial resources	Adhere to the Public Financial Management Act 2015(PFM Act 2015) and best financial management practices	Accurate and timely Financial and Audit reports	5	1	1	1	1	1	0.5	0.5	0.5	0.5	0.5	2.5	MF&A
	Monitor expenditure against the budgetary allocations	Quarterly budget reports	20	4	4	4	4	4							MF&A
	Develop and implement procurement plan	Procurement plan	5	1	1	1	1	1							PM
		Quarterly procurement reports	20	4	4	4	4	4							
	Capacity building of suppliers	Yearly reports	5	1	1	1	1	1	0.5	0.5	0.5	0.5	0.5	2.5	PM
	Review the finance manual and strengthen internal controls	Reviewed and fully implemented finance manual	1	1					3					3	MF&A

APPENDIX III: KEY PERFORMANCE INDICATORS

KRA	Strategic Objective		2020/21	2021/22	2022/23	2023/24	2024/25
Nuclear Power Infrastructure Development	To ensure availability of key nuclear power infrastructure	Level of nuclear power infrastructure development	10%	25%	50%	65%	75%
	To have an adequate and supportive legal and regulatory framework	Level of legal and regulatory preparedness for NPP	10%	30%	40%	60%	70%
	To inculcate nuclear safety culture among the key stakeholders	Level of adoption of nuclear safety culture	10%	25%	40%	50%	60%
Public Education and Stakeholder Engagement	To increase stakeholder's awareness and support of NuPEA's mandate	Level of implementation of public communication and stakeholder engagement strategy	100%	100%	100%	100%	100%
Energy Research and Development	To champion use of safe, efficient and sustainable energy systems	Adoption level of safe, efficient and sustainable energy systems	5%	10%	25%	50%	70%
	To enhance uptake of new technologies and innovations in the energy and petroleum sectors.	Number of energy innovations patented				1	1
Capacity building in the Energy and Petroleum Sectors	To ensure availability of skilled and competent human capital in the Energy and Petroleum Sectors	Level of implementation of capacity building coordination framework	-	25%	40%	60%	80%
Institutional Capacity	To enhance good corporate governance	Legal Compliance	100%	100%	100%	100%	100%
		Compliance with ERM	100%	100%	100%	100%	100%
	To have a versatile, competent, highly performing and motivated workforce	Employee Satisfaction Index	65%	70%	75%	80%	85%
		Staff productivity Index	75%	80%	85%	90%	95%
	To enhance efficiency and effectiveness in service delivery	Automation level	55%	60%	70%	80%	100%
		Installed ICT systems utilization level	80%	85%	90%	95%	100%

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