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MINISTRY OF ENERGY

ANNUAL PROGRESS REPORT

FOR

FINANCIAL YEAR 2017/18

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FOREWORD

The Ministry of energy plays an important role in the achievement of the vision 2030 through successive five-year horizon Medium Term Plans and strategic plans. The Ministry is one of the infrastructure enablers and is instrumental in the realization of the Big 4 Agenda and Sustainable Development Goals (SDG) goal No. 7 among other Government plans and objectives. Energy contribution to national development is in the following aspects: Enhancing power generation capacity; Transmission and Distribution network reinforcement and expansion; enhancing regional trade through interconnection of regional networks; Enhancing access to electricity; Promoting renewable energy and introduction of new technologies in electricity generation. Improved access to energy sources especially electricity improves human development conditions through provision of water; industrial and agricultural productivity; disadvantaged groups empowerment; better health and education conditions and environmental sustainability.

The Ministry is mandated to implement the following core programmes: Power generation; Transmission and Distribution of electricity; and Alternative Energy technologies. During the Financial Year 2017/2018, the Ministry implemented critical energy programmes in wind, hydropower, geothermal, coal exploration and development, nuclear power development, transmission and distribution upgrading and expansion and Alternate Energy Technologies. These enhanced the national electricity expansion and reinforcement, improved reliability of energy services, increased national electricity access rate and put Kenya on the path to achieving *“Universal Electricity Access”* by year 2022.

A notable tremendous achievement in scaling up connectivity was raising the access rate to 75% in 2017/18 (both from grid and off-grid solutions). This has been achieved through interventions by the government in collaboration with the development partners and communities as social facilitators. These interventions included Last Mile Connectivity and street lighting programmes among others.

Some of the challenges the Ministry experienced included: protracted process in way leaves acquisition; inadequate financial resources; mismatch of power generated and the demand growth among others. However power supply reliability will be enhanced through network automation, system reinforcement and use of modern technologies. Several measures will also

be taken to enhance promotion and development of renewable energy as an alternative source of energy.

Comprehensive stakeholder participation and partnership with the international community; Public Private Partnerships (PPP); Engineering Procurement Contracting and Financing (EPC + F) as financing options for sustainability of infrastructure development; safety and security of the infrastructure and environmental sustainability during energy infrastructure development will be our main future consideration to ensure enhanced affordable, clean and reliable electricity supply.

HON. CHARLES KETER, EGH
Cabinet Secretary
Ministry of Energy

PREFACE

This Annual Progress Report covers the 2017/18 achievements by Ministry of Energy in the implementation of its mandates as contained in the revised Executive Order No. 1 of June 2018 on the Organization of Government of Republic of Kenya. The achievements were realized through implementation of four programmes which included: Power Generation; Power Transmission and Distribution; Alternative Energy Technologies; and Administrative, Planning and Support Services.

Among the key achievements realized during the 2017/18 review period included; 581,639 new customers connected to electricity increasing the cumulative connection to 6,763,921; 529.5Km of transmission line and 2 new high voltage substations were constructed; 1174Km of medium voltage distribution lines and 6 distribution substations were constructed; 10.25MW of additional power was installed bringing the total installed capacity to 2341MW; 350 public facilities were connected to electricity which included markets, trading centres, health centres, Government offices, water points and tea buying centres; 35,346 Street lighting points were installed in major towns in all the 47 Counties across the country to promote 24hr economy in addition to enhancing security in designated public places; 37 people were trained on nuclear related courses both locally and in internationally accredited institutions; 11 potential nuclear power Plant sites were identified; Land adjudication, registration and issuance of title deeds for coal development in Mui Basin for Blocks C & D and Blocks A & B continued; stakeholders' engagements to promote coal exploration and development in the country were undertaken; and eighteen (18) energy investment Grade Audits and General Audits were conducted in collaboration with Kenya Association of Manufactures (KAM) aimed at promoting energy efficiency and conservation in industries.

Indeed this achievement was realized through enhanced partnership among different stakeholders and the sustained government support. In the anticipated launch of the Kenya National Electrification Strategy, more robust resources and models will be mobilized and explored towards achieving Country universal access by year 2022 in compliance with global SDGs and the National objectives.

In order to address the implementation challenges and ensure universal access to electricity the following measures should be considered: Increased budgetary support for energy sector; Expansion and strengthening the energy infrastructure to deal with every increasing demand of energy services in the country; Adoption of innovative alternative financing models such as

public private partnerships; Embracing new renewable energy technologies such as minigrids, stand alone solar systems among others to reach off-grid areas; Diversification of the energy mix to promote energy security and reduce energy cost; effective stakeholder management; and creation of adequate and effective human capacity for projects management.

In line with the changing social economic environment a number of cross cutting issues have been identified as relevant to all aspects of energy development. These issues include; projects land acquisition, environmental sustainability, gender concerns, disaster risk reduction and community involvement.

Dr. (Eng.) JOSEPH K. NJOROGÉ, CBS
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ACRONYMS

APR	Annual Progress Report
CEEC	Centre for Energy Efficiency and Conservation
(EPC + F)	Engineering Procurement Contracting and Financing
ERC	Energy Regulatory Commission
GDC	Geothermal Development Company
GoJ	Government of Japan
GOK	Government of Kenya
IPPs	Independent Power Producers
KAM	Kenya Association of Manufacturers
KENGEN	Kenya Electricity Generating Company
KETRACO	Kenya Electricity Transmission Company
KNEB	Kenya Nuclear Electricity Board
KPLC	Kenya Power & Lighting Company Limited
LCPDP	Least Cost Power Development Plan
MDAs	Ministries/Departments/Agencies
MT	Magneto-Telluric
NMC	Numerical Machining Complex
PPP	Public-Private-Partnership
REA	Rural Electrification Authority
SAGAs	Semi-Autonomous Government Agencies
SDGs	Sustainable Development Goals
TA	Technical Assistance

Background Information

Kenya Vision 2030 and the Third Medium Plan 2018-2022 identify energy as one of the infrastructure enablers for sustained economic growth, development and poverty reduction and for transformation into “a newly-industrialising, middle-income country providing a high quality of life to all its citizens in a clean and secure environment”. Access to affordable, competitive, reliable, quality, safe and sustainable energy will contribute to achievement of the “Big 4 Agenda”, Sustainable Development Goals and Kenya Vision 2030.

Investment in Energy Sub-Sector contributes to lowering the cost of doing business, improved security, and improved livelihoods and enhanced country’s global competitiveness. Implementation of programmes and projects will focus on accessibility, affordability, competitiveness, quality, their functionality, job creation, disaster preparedness and protection of the environment. The sub-sector aims at sustaining and expanding energy infrastructure to support a rapidly-growing economy.

The strategies and measures to be pursued in the Medium Term include; supporting development initiatives around flagship projects, strengthening institutional framework, enhancing efficiency and quality as well as increasing the pace of projects so that they are completed as envisaged, protecting the environment as a national asset and conserving it for the benefit of the future generations and the wider international community. Other measures include encouraging private sector participation in the provision of energy services through the Public-Private-Partnership (PPP) framework.

1.2 Vision and Mission

The Ministry’s Vision is *“Affordable quality energy for all Kenyans”* while the Mission is *“to facilitate provision of clean, sustainable, affordable, competitive, reliable and secure energy services at least cost while protecting the environment”*.

1.3 Strategic goals/ Objectives

The broad objective of the Ministry is to ensure that adequate and affordable quality energy is supplied to all Kenyans for socio - economic development. The specific objectives are to:

- i. Strengthen the Policy, Legal and Institutional framework for the energy development and accelerating the speed of completion of projects;
- ii. Improve access to competitive, reliable and safe supply of energy to all Kenyans;

- iii. Promote Sustainable energy self-sufficiency;
- iv. Promote Efficient utilization and conservation of energy;
- v. Increased access to electricity in rural areas;
- vi. Promote Exploration and development of geothermal and fossil fuel resources;
- vii. Promote development of new and renewable energy sources;
- viii. Optimal utilization of both human and financial resources;
- ix. Explore alternative financing models for energy sub-sector projects; and
- x. Enhance Public-Private Partnerships in the provision of energy facilities and services.

1.4 Ministry's Mandate

The Ministry's mandate as contained in the revised Executive Order No. 1 of June 2018 on the Organization of the Government of the Republic of Kenya are:-

- i. National Energy Policy Development and Management.
- ii. Thermal Power Development.
- iii. Rural Electrification Programme.
- iv. Energy Regulation, Security and Conservation.
- v. Hydropower Development.
- vi. Geothermal Exploration and Development.
- vii. Promotion of Renewable Energy

1.5 Autonomous and Semi-Autonomous Government Agencies

The institutional structure of the energy sub sector comprises of Ministry of Energy, Energy Regulatory Commission (ERC), Kenya Electricity Generating Company (KenGen), Kenya Power and Lighting Company (KPLC), Rural Electrification Authority (REA), Kenya Electricity Transmission Company (KETRACO), Geothermal Development Company (GDC), Kenya Nuclear Electricity Board (KNEB), Energy Tribunal, private sector actors and energy service users/customers.

Semi-Autonomous Government Agencies (SAGAs) under the Ministry of Energy and their role in implementation of the Ministry's mandate are as below:\

i. Energy Regulatory Commission (ERC)

It was established as an energy sector regulator under the Energy Act, 2006, with responsibility for economic and technical regulation of electric power, renewable

energy, and downstream petroleum sub-sectors. Its functions also include tariff setting, review, licensing, enforcement, dispute settlement and approval of power purchase and network service contracts.

ii. **Kenya Power & Lighting Company Limited (KPLC)**

KPLC is a State Corporation established by The Electric Power Act CAP 314 (Revised 1986) with a mandate of purchasing electrical energy in bulk from KenGen and other power producers and carries out transmission, distribution, supply and retail of electric power.

iii. **Kenya Electricity Generating Company Limited (KenGen)**

KenGen is a State Corporation with GoK shareholding of 70% and private shareholding of 30% established by the Companies Act CAP 486 of 1954 (Revised 1997). It is mandated to generate electric power, currently producing the bulk of electricity consumed in the country. The company utilizes various sources to generate electricity ranging from hydro, geothermal, thermal to wind.

iv. **Rural Electrification Authority (REA)**

REA was established under section 66 of the Energy Act of 2006 as a body corporate with the principal mandate of extending electricity supply to rural areas, managing the rural electrification fund, mobilizing resources for rural electrification and promoting the development and use of renewable energy.

v. **Geothermal Development Company Limited (GDC)**

GDC was incorporated in 2008 by Energy Act No 12 of 2006. This is a 100% state-owned company established by the Government of Kenya as a Special Purpose Vehicle for the development of geothermal resources in Kenya.

vi. **Kenya Electricity Transmission Company Limited (KETRACO)**

KETRACO was established by the Energy Act of 2006. This is a GoK wholly owned company established to be responsible for the development, maintenance and operation of the national transmission grid network. It is also responsible for facilitating regional power trade through its transmission network.

vii. **Kenya Nuclear Electricity Board (KNEB)**

KNEB was established by the State Corporation Act CAP 446, Legal Notice No. 131 of 16th November 2012. KNEB is charged with the mandate of spearheading and fast tracking development of nuclear electricity generation in order to enhance the production of affordable and reliable electricity.

1.6 Roles of Sub-Sector Stakeholders

Key Stakeholders in the Energy Sub-Sector include the:-

- i. **Energy Tribunal**
This quasi-judicial body was established under section 108 of the Energy Act, 2006. It came into operation in July 2007 to primarily hear appeals against the decisions of ERC. It also has jurisdiction to hear and determine all matters referred to it relating to the energy sector. This tribunal is under the Judiciary.
- ii. **Independent Power Producers (IPPs)** are private companies which generate power and sell electricity in bulk to Kenya Power as the electricity off taker, distributor and retailer.
- iii. **Centre for Energy Efficiency and Conservation (CEEC)** established jointly by GoK and the Kenya Association of Manufacturers to champion energy conservation and efficiency.
- iv. **Private power contractors** are private companies that are contracted to expand and upgrade power generation, transmission and distribution infrastructure. Among them also includes Technology Service Providers.
- v. **Regional and International Community** which is key in collaboration of research and development and also facilitating power trade across the regional through regional interconnectors.
- vi. **Development Partners** who provide project financing.
- vii. **Energy consumers and general public** who provides land and labour for energy infrastructure development.

1. Introduction

The overall national development objectives of the Government of Kenya as set out in Vision 2030 are: accelerated economic growth; increasing productivity of all sectors; equitable distribution of national income; poverty alleviation through improved access to basic needs; enhanced agricultural production; industrialization; accelerated employment creation and improved rural-urban balance. The realization of these objectives will be feasible if quality energy services are availed in a sustainable, competitive, cost effective and affordable manner to all sectors of the economy ranging from manufacturing, services, mining, and agriculture to households.

The 2017/18 APR highlights the programmes and projects implemented and the achievements made. Power supply reliability continued to be enhanced through network automation, system reinforcement and use of modern technologies. Several measures were undertaken enhance promotion and development of renewable energy as an alternative source of energy.

The specific achievements of the Ministry of Energy during the period were in the following key intervention areas: Enhancing power generation capacity, expanding and upgrading electricity transmission network, power distribution, and nuclear development and promoting renewable energy technologies.

The major achievements realized in 2017/18 are outlined in section three (3).

2. Key Programmes/Projects Performance - 2017/18

During the period under review the Ministry implemented five programmes namely: and sub-programmes as listed below: Power Generation; Power Transmission and Distribution; Alternative Power Technologies; and General Administration and Support Services.

The major achievements in the delivery of outputs during the period 2017/18 FY are as summarized below in Table 3.1.

Table 3.1: Summary of the key achievements against the set targets.

Programme/ Project	Unit of Measure	Institution	Target FY 2017/ 18	Achievement as at the end of June 2018	Comments
A. POWER GENERATION					
1.	Generation capacity	KPLC	22	10.25	It's expected that Orpower4 plant IV Phase 2 (10MW) and Strathmore (0.25MW) were brought on board.
2.	Construction of Olkaria Power Plants: Olkaria V (140MW)	Kengen	15	52	Civil works and detailed design for all contract Lots in progress; Manufacturing of main equipment ongoing; Manufacturing of Main equipment ongoing; Overall construction progress at 32%
3.	Olkaria VI (140MW)	KenGen	5	10	Variation of TA Consultancy Contract has been approved by PPP Unit and The World Bank and Final Feasibility Report expected in August 2018
4.	Olkaria I unit 6 (70MW)	KenGen	15	30	Lot 2 Contract Documents submitted to AG's office for approval; Lot 1 Pre-Contract negotiation completed and contract document compilation in progress; No objection for Lot 1 Financial evaluation received from Financiers.
5.	Olkaria I Rehab	KenGen	7	15	Loan agreement signed between GoJ and GoK and Tender documents

Programme/ Project	Unit of Measure	Institution	Target FY 2017/ 18	Achievement as at the end of June 2018	Comments
(51MW)					submitted to JICA for No Objection
6. Completion of the Steam Gathering System for Menengai 105MW Power Plant	%	GDC	100	96	Pending works include; Completion of fabrication of the pipeline, Lagging/ insulation of the pipeline, Installation of steam metering instruments and Installation of control room instruments/ panels
7. Construction of lake Baringo Water System	%	GDC	100	74	Pump stations, waterline and water tanks installation is progressing well and are at about 65% completion.
8. Drilling of Geothermal Wells	No.	GDC	8	8	Eight (8) wells were drilled completed. These are: MW28A, MW12A, MW27, MW18B, MW19B, and MW8A, MW15A and MW20B.
9. Increase Cumulative Steam Available for Geothermal Power Production	MWe	GDC	187.6	169.4	Total steam available has been increased by 19.3 MWe bringing the cumulative megawatts of steam equivalent to 169.4 MWe in Menengai fields.
B. EXPAND AND UPGRADE ELECTRICITY TRANSMISSION NETWORK					
10. Transmission Lines Constructed	Km	KETRACO	860	529.5	Targets discrepancy in FYs is a result of 400 KV Loiyangalani –Suswa transmission line and 220kV Turkwel – Ortum which were not completed as scheduled.

Programme/ Project	Unit of Measure	Institution	Target FY 2017/ 18	Achievement as at the end of June 2018	Comments
					Two (2) transmission substations were also completed.
11. 96Km 132kV Meru-Isiolo- Nanyuki transmission line	Km	KETRACO	30	66	Cumulatively 66kms (68.04%) stringing was complete; 269 out of 283 foundations to date; 267 out of 283 towers erected to date; all substations completed. Meru-Isiolo section energized. Wayleave issues e.g. at Nanyuki Air Base whereby KDF has refused tower erection, court injunction and land sub-divisions near Nanyuki town and inadequate compensation budget have affected project progress
12. 44km 132kV Kisii- Awendo transmission line and associated Substations	Km	KETRACO	8	8	44Km stringing of the line completed and the line energized.
13. 428km 400kV Loiyangalani - Suswa transmission line	Km	KETRACO	428	11.3	991No. out of 991 tower foundations completed; 607No./991 tower erections completed; 11.3 km stringing done. Complete civil works in Loiyangalani

Programme/ Project	Unit of Measure	Institution	Target FY 2017/ 18	Achievement as at the end of June 2018	Comments
					substation apart from Shunt Reactor civil works were at 98.5% . Wayleave challenges affected civil works in some areas e.g. Samburu.
14.	138km 220kV Turkwel-Ortum- Kitale transmission line	KETRACO	96	43	Stringing of 43Km was completed. Tower foundations: 348 out of 348 (100%); Tower Erection: 344 out of 348 to date (at 98.9%) Project implementation was affected by Security challenges, compensations, difficult terrain that affects tower erection and local ranches conflicts.
15.	431km 132kV Power Transmission System Improvement Projects	KETRACO	298	154	154km km strung; 886 out of 1300 towers erected; 1204 out of 1300 tower foundations completed; All substations completed and Ishiara-Kieni and Sotik-Bomet lines were energized. Foundations; Kitui-Wote 66No; Olkaria-Narok 158No.; Lessos - Kabarnet 159No Tower erection:

Programme/ Project	Unit of Measure	Institution	Target FY 2017/ 18	Achievement as at the end of June 2018	Comments
					Kitui-Wote 21No. Olkaria-Narok 72No. Lessos - Kabarnet 112No Project progress affected by ROW issues and inadequate compensation budget.
16.	100Km Homabay-Awendo	KETRACO	N/A	37.3	37.3Km Ndhiwa-Awendo line and Ndhiwa substation were completed.
17.	Turkwell Lokichar Project	REA	70	95	Kalimung'orok and Lokichar S/S=100% complete, 66kV line=80% complete, Turkwel- Lokichar line=95% complete
C.	POWER DISTRIBUTION				
18.	Universal Access: Number of New Customers Connected to electricity	No.	1,200,000	581,639	Connection rate affected by non provision of budget. Total number of New Customers Connected to electricity increased to 6,763,921.
19.	Expand and Upgrade Electricity Distribution Network	Kms	1,033	1,174	Length of Distribution Lines Constructed is above target due to MV distribution lines added into the existing grid undertaken by KEEP Project, Turnkey Contractors and

Programme/ Project	Unit of Measure	Institution	Target FY 2017/ 18	Achievement as at the end of June 2018	Comments
					L&T contractors.
20. Number of New and Upgraded Distribution Substations completed	No.	KPLC	14	9	Works on the five (5) substations not completed was at 85% by end of 2017/18 FY
21. Street Lighting Project	No.	KPLC	30,000	35,346	The target was surpassed
22. Installation of Transformers	No.	REA	1,000	525	Slow progress due to the new electronic system installed and heavy rain in some parts of the country.
23. National Electrification No. of Public Facilities Electrified	No.	REA	173	350	Target met.
24. Implement Phase 1 Last Mile Project.	No. of Transformers installed	KPLC	3,704	1,353	The below the target achievement was caused by wayleave issues, implementation of InCMS which slowed process of metering and slow delivery of poles in Lot 2 and 4. 835 transformers were also

Programme/ Project	Unit of Measure	Institution	Target FY 2017/ 18	Achievement as at the end of June 2018	Comments
					maximized bringing the total maximized transformers to 101,837.
25.	Average time to connect new business customers Days	KPLC	51.3	34	Improved performance of 34days against a target of 51.3 was due to enhanced monitoring.
26.	Process Electric Power Undertaking Licenses Days	ERC	80	43.60	Performance above target.
27.	Process Power Purchase Agreements Days	ERC	60	60	Target achieved
28.	Garissa 50 MW Solar Plant %	REA	75	75	Target surpassed. Filing and civil (Electrification, gates and fencing) works completed. 201,000 panels installed.
29.	Solar Hybrid Stations No.	REA	20	5	Target underachieved. Flooding in some off-grid areas in North and North Eastern regions delayed the project implementation.

Programme/ Project	Unit of Measure	Institution	Target FY 2017/ 18	Achievement as at the end of June 2018	Comments
30.	Isolated Diesel Stations	No.	4	4	Banisa, Lokiriana, Maikona and kakuma stations completed.
D. NUCLEAR DEVELOPMENT					
31.	Strategic Environmental Assessment.	%	100	100	Draft SEA Report was developed The public review of the Draft SEA Report was reviewed by: Reviewing the work plan for public/county participation, Drafting/writing of invitation letters to the counties for public participation (County level); and Holding forums for public engagement at the county levels.
32.	Development of the Policy, Legal and Regulatory Framework for the Nuclear Power Programme	%	100	100	National Nuclear Energy Policy was developed. Draft Nuclear Regulatory Bill was developed
33.	Identification of Potential Nuclear Power Plant Sites.	No	11	11	Target was met

Programme/ Project	Unit of Measure	Institution	Target FY 2017/ 18	Achievement as at the end of June 2018	Comments
34.	%	KNEB	100	100	Target met
35.	No	KNEB	13	13	Target met
36.	%	KNEB	100	100	The board has undertaken various activities including development of the national NFC policy and strategy and reactor technology assessment for large nuclear power plant.
E. RENEWABLE ENERGY TECHNOLOGIES					
37.	No.	MoE	75	-	Preliminary activities completed. Tenders for the 80 Institutions were awarded.
38.	No.	MoE	50	130	The target was surpassed

Programme/ Project	Unit of Measure	Institution	Target FY 2017/ 18	Achievement as at the end of June 2018	Comments
39. Installation of institutional biogas digesters	No.	MoE	2	2	Completed
40. Hydro-dam catchment re- afforestation (acreage)	No.	MoE	260	500	Target over-achieved
41. Investment grade energy audits carried out	No.	MoE	18	18	Completed
F. Access to Government Procurement Opportunities	KShs Million	ALL	KenGen =1,341 KPLC =3,000 GDC=206.1 KETRACO=150 ERC=6.6 REA=400.9 KNEB=34	MoE=19.4 KenGen =1,341 KPLC =2,200 GDC=326.7 KETRACO=33.6 ERC=15 REA=1,498 KNEB=36	Total procurement taken up by the target group was above the target for GDC, KenGen, ERC and KNEB but below the target for KPLC, KETRACO, REA

Programme/ Project	Unit of Measure	Institution	Target FY 2017/ 18	Achievement as at the end of June 2018	Comments
G.	KShs Million	ALL	KenGen =4,084	KenGen =4,084	The performance was above the target for GDC, KenGen, KETRACO, ERC, REA and KNEB but below the target for KPLC
			KPLC =16,000	KPLC =13,492	
			GDC=845.7	GDC=766.2	
			KETRACO=200	KETRACO=326.3	
			ERC= 117.6	ERC=117.6	
			REA=1447.8	REA=3,300	
			KNEB=59.1	KNEB=60	
CROSS CUTTING ISSUES					
H.					
42.	Youth Internships/industrial	No.	ALL	KenGen=1,239	The performance was above the target for, KenGen, KPLC, KETRACO, ERC, REA and KNEB but below the

Programme/ Project	Unit of Measure	Institution	Target FY 2017/ 18	Achievement as at the end of June 2018	Comments
attachments/Apprenticeships			KPLC=1,795	KPLC=1,885	target for GDC
			GDC=210	GDC=123	
			KETRACO=80	KETRACO=86	
			ERC= 40	ERC= 40	
			REA=50	REA=76	
			KNEB=13	KNEB=13	

3. Analysis of Financial Performance

Approved total budget for the Ministry of Energy went down from KShs. 111,426 million in 2016/17 FY to 77,104 million in 2017/ 18. Similarly, approved development budget went down to Kshs. 74,950 million in 2017/ 18 from Kshs.109,343 million in 2016/17 FY. The approved recurrent budget increased from Kshs. 2,084 million to Ksh.2, 154 million in 2016/17 and 2017/18 FYs respectively. The actual expenditure as a percentage of the total approved budget was 89% for financial years 2017/18.

Major funding was to the power transmission and distribution programme with an allocation of Kshs 57,650 million representing 74.7% of the total approved budget in the financial years 2017/18. The same trend is followed by power generation programme with an allocation of Kshs. 10,561 million at 13.7%.

Tables 3.2, 3.3 and 3.4 shows analysis of recurrent expenditure, development expenditure and Programme/Sub-Programme respectively for the FY 2017/18

Table 3.2 Analysis of Recurrent Expenditure

	Approved Budget Kshs. Millions	Actual Expenditure Kshs. Millions
Economic Classification	2017/18	2017/18
GROSS	2,154	2,073
AIA	229	207
NET	1,925	1,866
Compensation to Employees	354	341
Transfers	1551	1551
Other Recurrent	249	181

Table 3.3: Analysis of Development Expenditure

	Approved Budget Kshs. Millions	Actual Expenditure Kshs. Millions
Economic Classification	2017/18	2017/18
GROSS	74,950	66,297
GOK	35,888	35,445
LOANS	31,624	26,944

GRANTS	296	126
LOCAL AIA	7,142	3,782

Table 3.4: Analysis of Programme/Sub-Programme Expenditure

		Approved Expenditure	Actual Expenditure
Programme		2017/18	2017/18
Power Generation			
Coal Exploration and Mining		1,186	973
Geothermal Development		8,867	8,493
Sub-Programme.3: Nuclear Energy Development		508	508
Total Power Generation		10,561	9,974
Power Transmission and Distribution			
National Grid System		40,257	35,800
Rural Electrification		17,393	14,477
Total Power Transmission and Distribution		57,650	50,277
Alternative Energy Technology			
Sub-Programme1: Alternative Energy Technologies		8,148	7,556
Total Alternative Energy Technology		8,148	7,556
Administration Planning and Support Services			
Administrative Services		561	391
Planning Services		98	95
Financial Services		86	76
Total Administration Planning and Support Services		745	562
Grand Total		77,104	68,369

4. Challenges and Mitigation Measures

Challenges/Risks	Mitigation Measures (Way Forward)
Mismatch in electricity demand and generation capacity expansion.	- Actualisation of vision 2030 flagship projects - Pursue capacity expansion strategies that ensure balancing of supply and demand
Multiple Levies demanded by various Government entities for power infrastructure	Intervention by Government to resolve disputes, set relevant policy and harmonise relevant laws
Right of Way for power infrastructure projects, (way leaves acquisition, encroachment, trace clearance) and land acquisition, leading to huge claims by Contractors due to stoppage of works.	- Review of the existing legal and institutional frameworks that govern wayleave and land acquisition. - Enactment of Public Participation Bill, 2016 - Public Education - Engaging Government, County and other public bodies - Enforcement of Land Laws (Amendment) Act No. 28 of 2016. - Undertake due diligence on the projects. - There is need to plan and acquire land in advance to meet the current and future infrastructure expansion requirements given its ever increasing costs.
High initial connection costs	- Loan facilities for customers - Support from GOK to meet connectivity costs - Review costs to increase efficiencies - Pre-investment by the government especially in Greenfield.
Balancing competing objectives in the sector such as rapid capacity expansion against the need for lower tariffs and the need for greening our generation against the desire for cheaper reliable capacities that are not necessarily green such as coal	- Timely review of tariffs - Target low cost generation sources. - Balancing policy objectives through periodic and timely review of targeted policies.
Vandalism of electricity infrastructure	- Need for punitive legislation to guard against vandalism - Apply anti-vandalism technology - Sensitise local communities on protecting/policing

	power infrastructure ▪ Establish security intelligence system and community informers' frameworks ▪ Install security alarm and surveillance systems in all substations and strategic points along the lines
Inadequate financial resources and delayed disbursements	▪ Review of the Public Financial Management (PFM) Act, 2012 and the Regulations to increase efficiency in disbursements. ▪ Lobby National Treasury and National Parliament and Development Partners for more budgetary allocations ▪ Explore new business models e.g. formation of subsidiaries for off balance sheet financing, EPC+Finance and Public Private Partnerships (PPPs). ▪ Diversification of revenue sources – Exchequer, development partners, freeway leaves, partnerships with county governments, enhanced customer connections
Insecurity and community conflicts in project areas	▪ Need for security arrangements for power infrastructure projects and guard against potential terror attacks. ▪ Conflict management measures.
Inadequate human resource capacity	▪ Establishment of National Centres of Excellence in the Energy sector. ▪ Capacity building programmes through Benchmarking and partnerships
High pre-development costs for Energy Projects	▪ Continued GOK support in mobilizing resources to fund the upfront costs through Government to Government grant propositions and other innovative approaches. ▪ Promote Public Private Partnerships (PPPs).
High electricity tariff	▪ Promote the development of cheap sources of electricity such as geothermal, nuclear, LNG and coal. ▪ Deliberate interventions in the energy market through fiscal incentives (taxes, duties, levies) and non-fiscal incentives (subsidies, fees, guarantees, credits).
Inadequate Legal and regulatory framework to address emerging issues in the energy sector.	▪ Review the legal, regulatory, policy and institutional framework in the energy sector to address the emerging issues in the sector.

5. Conclusion

There is indeed a strong case to sustain the increased national resources and revenue to the sector to diversify the power generation mix from all commercially viable domestic alternative sources of energy including geothermal, wind, and solar to mitigate effects of drought and unstable global oil prices. This will help in achievement of the government public policy pronouncements to promote aggressive investments in the energy Sector to expand the primary energy resources base in the country, increase the proportion of cost effective and green energy in the country's generation mix, enhance the quality of supply through a modernized supply and distribution system and ultimately provide the economy with affordable and quality energy to support economic activities.

The Government through designate statutory institutions including The National Land Commission, The Attorney General Office should as a matter of high priority develop a framework for land acquisition having review of laws and policies to guide acquisition of land and right of way for public infrastructure projects. Implementation of energy projects have suffered delays and cost overruns due to community issues associated with right of way issues.

In line with power plan, there is need for financial and capacity investments to fastrack regional electricity interconnectors and power pools to stabilize electricity supply, optimize investments and lower power costs as well as enhancing power demand. The Government need to prioritize Public Private Partnerships (PPP) in the energy sector to increase investments in renewable energy. The Government need to identify facilitative interventions and implement policies that will attract private sector to develop energy projects with minimum delay moving forward.

There is need to increase budgetary support to energy programmes and projects in order to realize the universal access to electricity by 2022. There is also an urgent need to fast-track the processing of Energy Bill 2017 currently before the Senate to enable the anticipated national objectives and inclusive of the county government's integration into the sector goals.

Annex I: Project Concept Notes

A. KENYA ELECTRICITY GENERATING COMPANY (KenGen)

1. Olkaria V Geothermal Development Project 165.2 MW

Project name	Olkaria V Geothermal Development Project 165.2 MW				
Project Geographical Location	Olkaria domes in Naivasha				
Project Type/Category	Mega project				
Implementing organization	Kenya Electricity Generating Company Plc				
County Located	Nakuru				
Project purpose	To efficiently generate competitively priced electricity, enhance volume and security of electric power supply in Kenya by building a new geothermal power plant of 140 MW capacity using state of the art technology, thereby creating a conducive investment climate and enabling sustainable economic growth in Kenya. The project is an enabler for the big -4 agenda in particular manufacturing in terms of provision of affordable, reliable and green supply of electricity.				
Brief Description	The project is meant to inject to the National grid 165.2MW through building a new Geothermal power plant in Olkaria. The project is part of the 5000+ MW Government of Kenya (GoK) initiative for additional electricity generation capacity. The main activities will include procurement of consultant and contractor, construction of power plant and related infrastructure.				
Project stage	Construction of the power Plant, Steam field development and transmission and substation ongoing.				
Estimated project duration	31 months (Exclusive of Defect Liability Period)				
Estimated project cost (Equiv. Kshs63B)	FY 2017/2018	FY 2018/2019	FY 2019/2020	FY 2020/2021	FY 2021/2022
	Kshs. Million				
	800	1,800	1,892	-	-
Economic and social benefits Outline	Reduction in power tariff through availability of affordable electricity thereby benefiting the consumers as well as creating a conducive investment environment for local and international investors.				
Source of financing	1. Proceeds of loan from JICA on-lent to KenGen by GOK through A Subsidiary Loan Agreement, KenGen is financing the counterpart fund through the internal cash flow.				

2. Olkaria I Unit 6 Geothermal Development Project 83.3MW

Project name	Olkaria I Unit 6 Geothermal Development Project 83.3MW
Project	

Geographical Location	Olkaria in Naivasha				
Project Type/Category	Mega Project				
Implementing organization	Kenya Electricity Generating Company Plc				
County Located	Nakuru				
Project purpose	To efficiently generate competitively priced electricity, enhance volume and security of electric power supply in Kenya by building a new unit of geothermal power plant of 83.3 MW capacity using state of art technology, thereby creating a conducive investment climate and enabling sustainable economic growth in Kenya. The project is an enabler for the big -4 agenda in particular manufacturing in terms of provision of affordable, reliable and green supply of electricity.				
Brief Description	The project is meant to contribute to the National grid 83.3MW by building a Geothermal power plant in Olkaria. The project is part of the 5000+ MW Government of Kenya (GoK) initiative for additional electricity generation capacity. The main activities will include procurement of consultant and contractor, construction of power plant and related infrastructure.				
Project stage	Project under procurement Phase				
Estimated project duration	29 months (Exclusive of Defect Liability Period)				
Estimated project cost (Equiv. Kshs.32B)	FY 2017/2018	FY 2018/2019	FY 2019/2020	FY 2020/2021	FY 2021/2022
	Kshs. Million				
	NIL	1,294	5,654	1,128	-
Economic and social benefits Outline	Reduction in power tariff through availability of affordable electricity thereby benefiting the consumers as well as creating a conducive investment environment for local and international investors				
Source of financing	1. European Investment Bank(EIB) 2. KfW Development Bank 3. Japan International Co-Operation Agency(JICA) 4. KenGen				

3. Olkaria II Purchase of spare parts

Project name	Olkaria II Purchase of spare parts
Project Geographical Location	Olkaria in Naivasha
Project Type/Category	Medium Project
Implementing	Kenya Electricity Generating Company Plc

organization					
County Located	Nakuru				
Project purpose	To efficiently generate competitively priced electricity, enhance reliability and security of electric power supply in Kenya by minimizing number of outages and outage periods in the 105MW plant by ensuring availability of critical spare parts for the plant, thereby creating a conducive investment climate and enabling sustainable economic growth in Kenya.				
Brief Description	The project is meant to help stabilize the National grid by minimizing forced outages and reduction of reliance on fossil fuel fired plants occasioned by long outages where spares are not readily available. The main activities will include identification of required critical spares, identification of original equipment manufacturers, tendering and procurement of identified critical spares. The project is an enabler for the big 4 agenda in particular manufacturing in terms of provision of affordable, reliable and green supply of electricity				
Project stage	Production and delivery of spare parts for the Olkaria II power plant ongoing.				
Estimated project duration	6 months				
Estimated project cost (Equiv. Kshs.110M)	FY 2017/2018	FY 2018/2019	FY 2019/2020	FY 2020/2021	FY 2021/2022
	Kshs. Million				
	NIL	110	NIL	NIL	NIL
Economic and social benefits Outline	Reduction in power tariff through availability of affordable electricity thereby benefiting the consumers as well as creating a conducive investment environment for local and international investors				
Source of financing	Balance of funds from KFW loan for Olkaria II Loan Agreement.				

4. Olkaria I Rehabilitation Geothermal Power Project

Project name	Olkaria I Rehabilitation Geothermal Power Project
Project Geographical Location	Olkaria in Naivasha
Project Type/Category	Mega Project
Implementing organization	Kenya Electricity Generating Company Plc
County Located	Nakuru
Project purpose	To enhance volume and security of electric power supply in Kenya by rehabilitation of the existing plant and upgrading the old units to 51MW,

	thereby increasing the lifespan of the station by another 25years. The project is an enabler for the big 4 agenda in particular manufacturing in terms of provision of affordable, reliable and green supply of electricity.				
Brief Description	The project is meant to contribute to the National grid 51MW by rehabilitating the existing Olkaria I power plant which has reached the end of its useful life. The project is expected to contribute additional +6 MW capacity after upgrading the existing 45MW power plant. The main activities will include procurement of consultant and contractor, construction of power plant and related infrastructure.				
Project stage	Procurement phase. The procurement of the contractor is ongoing				
Estimated project duration	40 months				
Estimated project cost	FY 2017/2018	FY 2018/2019	FY 2019/2020	FY 2020/2021	FY 2021/2022
	Kshs. Million				
	Nil	Nil	924	8,320	Nil
Economic and social benefits Outline	Reduction in power tariff through availability of cheaper electricity thereby benefiting the consumers as well as creating a conducive investment environment for local and international investors.				
Source of financing	JICA Loan KE-P33				

5. Turbine uprate

Project name	Turbine uprate
Project Geographical Location	Olkaria in Naivasha
Project Type/Category	Mega Project
Implementing organization	Kenya Electricity Generating Company Plc
County Located	Nakuru
Project purpose	To efficiently generate competitively priced electricity, enhance volume and security of electric power supply in Kenya by uprating the existing Olkaria I unit 4&5 and Olkaria IV unit 1 and by 40 MW capacity using state of art technology, thereby creating a conducive investment climate and enabling sustainable economic growth in Kenya. The project is an enabler for the big 4 agenda in particular manufacturing in terms of provision of affordable, reliable and green supply of electricity.
Brief Description	The project is meant to contribute to the National grid 40MW by uprating the new Geothermal power plant in Olkaria plant. The main activities will include procurement of consultant and contractor, construction of power plant.

Project stage	Under financial closure with National Treasury and KfW.				
Estimated project duration	48 months				
Estimated project cost	FY 2017/2018	FY 2018/2019	FY 2019/2020	FY 2020/2021	FY 2021/2022
	Kshs. Million				
	NIL	NIL	680	6,120	Nil
Economic and social benefits Outline	Reduction in power tariff through availability of cheaper electricity thereby benefiting the consumers as well as creating a conducive investment environment for local and international investors				
Source of financing	Sourcing of funds from KfW.				

6. Gitaru Solar Power Plant

Project name	Gitaru Solar Power Plant				
Project Geographical Location	Gitaru Eastern Hydro				
Project Type/Category	Mega				
Implementing organization	Kenya Electricity Generating Company Plc				
County Located	Embu				
Project purpose	To efficiently generate competitively priced electricity, enhance volume and security of electric power supply in Kenya by developing a solar (photovoltaic) PV plant by 42.5 MW capacity using state of art technology, thereby creating a conducive investment climate and enabling sustainable economic growth in Kenya. The project is an enabler for the big 4 agenda in particular manufacturing in terms of provision of affordable, reliable and green supply of electricity.				
Brief Description	The project is meant to contribute to the National grid 42.5MW by installing the new (photovoltaic) PV power plant in Gitaru Eastern Hydros. The main activities will include procurement of consultant and contractor, installation of the solar panels and other related infrastructure..				
Project stage	Sourcing of funds				
Estimated project duration	24 months				
Estimated project cost	FY 2017/2018	FY 2018/2019	FY 2019/2020	FY 2020/2021	FY 2021/2022
	Kshs. Million				

	NIL	NIL	576	4,605	576
Economic and social benefits Outline	Reduction in power tariff through availability of cheaper electricity thereby benefiting the consumers as well as creating a conducive investment environment for local and international investors				
Source of financing	Sourcing of funds from development partners				

7. Ngong Wind Phase III

Project name	Ngong Wind Phase III				
Project Geographical Location	Ngong,				
Project Type/Category	Mega Project				
Implementing organization	Kenya Electricity Generating Company Plc				
County Located	Kajiado				
Project purpose	To efficiently generate competitively priced electricity, enhance volume and security of electric power supply in Kenya by developing wind power plant of 10 MW capacity using state of art technology, thereby creating a conducive investment climate and enabling sustainable economic growth in Kenya. The project is an enabler for the big 4 agenda in particular manufacturing in terms of provision of affordable, reliable and green supply of electricity.				
Brief Description	The project is meant to contribute to the National grid 10MW by installing the new wind turbine power plant in Ngong. The main activities will include procurement of the EPC contractor, Design, procure, Installation, Testing and commissioning of Wind turbine Generators and other related infrastructure.				
Project stage	Under financial closure with National Treasury and KBC bank of Belgium				
Estimated project duration	18 months				
Estimated project cost	FY 2017/2018	FY 2018/2019	FY 2019/2020	FY 2020/2021	FY 2021/2022
	Kshs. Million				
	NIL	NIL	127	2,026	380
Economic and social benefits Outline	Reduction in power tariff through availability of cheaper electricity thereby benefiting the consumers as well as creating a conducive investment environment for local and international investors				
Source of financing	Sourcing of funds from development partners				

8. Meru Wind Phase 1

Project name	Meru Wind Phase 1				
Project Geographical Location	Tigania				
Project Type/Category	Mega Project				
Implementing organization	Kenya Electricity Generating Company Plc				
County Located	Meru				
Project purpose	To efficiently generate competitively priced electricity, enhance volume and security of electric power supply in Kenya by wind power plant of 80MW capacity using state of art technology, thereby creating a conducive investment climate and enabling sustainable economic growth in Kenya. The project is an enabler for the big 4 agenda in particular manufacturing in terms of provision of affordable, reliable and green supply of electricity.				
Brief Description	The project is meant to contribute to the National grid 80 MW by installing the new wind farm power plant in Olkaria plant. The main activities will include Design, Supply, Construction, Installation, Testing and commissioning of Wind turbine Generators for 80 MW Windfarm and associated windfarm facilities including the electrical collector network				
Project stage	Under financial closure with National Treasury and KfW. Finalization of land acquisition				
Estimated project duration	24 months				
Estimated project cost	FY 2017/2018	FY 2018/2019	FY 2019/2020	FY 2020/2021	FY 2021/2022
	Kshs. Million				
	NIL	NIL	127	2,026	380
Economic and social benefits Outline	Reduction in power tariff through availability of cheaper electricity thereby benefiting the consumers as well as creating a conducive investment environment for local and international investors				
Source of financing	1. Agence Française de Développement (AFD) 2. KfW of Germany				

B. GEOTHERMAL DEVELOPMENT COMPANY (GDC)

1. BOGORIA-SILALI GEOTHERMAL PROJECT

1	Project name	Bogoria- Silali Geothermal Project
2	Project geographic location	Korosi, Paka, Silali
3	Project type	Mega Project
4	Implementing organization	Geothermal Development Company (GDC)
5	Counties covered	Baringo & Turkana
6	Project purpose	Energy has been cited as a critical enabler for the achievement of government's vision 2030 and the "Big Four" agenda. Geothermal energy has also been identified as the preferred least-cost and environmentally benign choice for electricity generation (LCPDP Report, 2016) and critical for the realization of Sustainable Development Goals (SDG) goal No. 7 of reliable, clean and affordable energy for all by 2030.
7	Brief description of project	Bogoria-Silali project aims to add 300MW geothermal energy to the national grid under phase I from Korosi, Paka and Silali fields. This will be achieved through drilling geothermal wells to extract steam from reservoirs formed as rainwater or other water seeps down and reaches hot zones at depths of about 3,000 meters underground. Harnessed steam is directed to rotate a steam turbine in a Power plant to generate electricity. To realize output of 300MW added to the national grid, the following key activities shall be undertaken; • Geoscientific exploration and obtain requisite permits and licenses • Develop infrastructure; access roads and water supply system • Drill, test and manage geothermal wells • Undertake feasibility study • Construct steam gathering system • Develop, operate and maintain Power Plant Existence of resource suitable for power generation is a key risk of any geothermal project. Resource risk can be mitigated through comprehensive and detailed surface studies, numerical simulation and interference tests. Drilling risks resulting from difficult drilling conditions such as geological structure and equipment failure. This can be mitigated through proper execution of drilling plan.
8	Project status	This is an ongoing project with the following milestones already achieved; • Land approval has been obtained from County Government of Baringo • way leaves acquisition currently ongoing • Funding from KfW secured, with disbursements currently at 30% • Detailed Surface studies done, Seismic monitoring ongoing • Construction of water supply system currently 74% complete • 103Km of access roads complete with 9 drilling pads done;

		Drilling operations due to expected to commence in September 2018				
9	Estimated project duration	80 months				
10	Estimated project cost	FY.2017/18	FY.2018/19	FY.2019/20	FY.2020/21	FY.2021/22
		Kshs. Million				
		1,550	1,425	6,397	6,397	6,374
11	Economic and social benefits	- Reliable power supply to customers; - Lower the cost of electricity tariffs due to inclusion of cheaper power mix; - employment opportunities and income generation; - Environmental sustainability through displacement of biomass and fossil fuel by cleaner and environmentally friendly alternatives. - Increase private sector participation – GDC undertakes initial steam field development to mitigate upfront risks associated with geothermal development that deters the private sector participation. - promote alternative uses of geothermal energy through direct uses				
12	Sources of financing	- Government exchequer - Donor funding - KfW - GRMF				

2. MENENGAI GEOTHERMAL PROJECT

1	Project name	Menengai Geothermal Development Project
2	Project geographic location	Menengai
3	Project type	Mega Project
4	Implementing organization	Geothermal Development Company (GDC)
5	Counties covered	Nakuru
6	Project purpose	Energy has been cited as a critical enabler for the achievement of government's vision 2030 and the "Big Four" agenda. Geothermal energy has also been identified as the preferred least-cost and environmentally benign choice for electricity generation (LCPDP Report, 2016) and critical for the realization of Sustainable Development Goals (SDG) goal No. 7 of reliable, clean and affordable energy for all by 2030.
7	Brief description of project	Menengai project aims to add 465MW geothermal energy to the national grid in phases I,II and III of 105MW, 60MW and 300MW respectively. This will be achieved by drilling geothermal wells to extract steam from underground reservoirs formed as rainwater or other water seeps down and reaches hot zones at depths of about 3,000 meters. Harnessed steam is directed to rotate a steam turbine in a Power plant to generate electricity

		for dispatch to national grid. To realize the output of 465MW of geothermal power to the national grid, the following key activities shall be undertaken; • Undertake Geoscientific studies • obtain requisite permits and licenses • Develop infrastructure; access roads and water supply system • Drill, test and manage geothermal wells • Undertake feasibility study • Construct steam gathering system • Develop, operate and maintain Power Plant Number of risks have been identified in a geothermal project. Existence of resource suitable for power generation is a key risk of any geothermal project. Resource risk can be mitigated through comprehensive and detailed surface studies, numerical simulation and interference tests. Drilling risks resulting from difficult drilling conditions such as geological structure and equipment failure. This can be mitigated through developing and proper execution of drilling plan.
8	Project status	Menengai Geothermal is an ongoing project with the following milestones already achieved; • Geothermal resource license obtained • PPP approval obtained <u>105MW Menengai Phase I</u> Overall Completion for the 105MW Menengai Phase I is 85% with following milestones achieved; • Drilling of required wells complete with steam output of 169.4 MWe available for conversion • Feasibility study for phase I of 105MW completed in March 2018 • Steam Gathering System construction nearing completion • Evacuation transmission line already complete • Three IPPs have been contracted to build 3 power plants each of 35MW • GDC has fulfilled all Conditions in contract signed with IPPs • 1 IPP already secured financial closure and expected to break soon. • Financial close is in progress for other 2 IPPs <u>60MW Menengai Phase II Project</u> following milestones already achieved on 60MW Menengai Phase II of the project; • Geoscientific studies complete • road network and water supply system complete • Drilling of geothermal wells currently ongoing

		300MW Menengai Phase III Project • Geoscientific studies done. More infill studies planned • Wayleave acquisition on privately owned lands on-going • Extension of roads and water supply planned				
9	Estimated project duration	211 months				
10	Estimated project cost	FY.2017/18	FY.2018/19	FY.2019/20	FY.2020/21	FY.2021/22
		Kshs. Million				
		6,561	3,433	7,630	6,654	4,967
11	Economic and social benefit	• Reliable power supply to customers; • Reduced electricity tariffs due to inclusion of cheaper power mix; • Employment opportunities and income generation; • Environmental sustainability through displacement of biomass and fossil fuel by cleaner and environmentally friendly alternatives. • Increase private sector participation in electricity generation				
12	Sources of financing	• Exchequer • Donor funding; AfDB, AFD, EIB, JICA, World Bank, NDF, NEPAD				

3. 300MW SUSWA GEOTHERMAL PROJECT

1	Project name	300MW Suswa Geothermal Project
2	Project geographic location	Mt. Suswa
3	Project type	Mega Project
4	Implementing organization	Geothermal Development Company (GDC)
5	Counties covered	Narok and Kajiado
6	Project purpose	Energy has been cited as a critical enabler for the achievement of government's vision 2030 and the "Big Four" agenda. Geothermal energy has been identified as the preferred least-cost and environmentally benign choice for electricity generation (LCPDP Report, 2016) and critical for the realization of Sustainable Development Goals (SDG) goal No. 7 of reliable, clean and affordable energy for all by 2030.

7	Brief description of project	The Suswa 300 MW geothermal project aims to add 300MW geothermal energy to the national grid. Project shall be undertaken in 3 phases each of 100MW project. The project entails the drilling and management of geothermal wells for connection to geothermal power plants for power generation. Key activities required to be undertaken are as follows; • Construction of access roads and drill pads • Develop water supply infrastructure • Drilling, testing and management of 33 geothermal wells • Feasibility study • Construction of the Steam gathering system • Power plants development Number of risks have been identified in a geothermal project. Existence of resource suitable for power generation is a key risk of any geothermal project. Resource risk can be mitigated through comprehensive and detailed surface studies, numerical simulation and interference tests. Drilling risks resulting from difficult drilling conditions such as geological structure and equipment failure. This can be mitigated through developing and proper execution of drilling plan.																			
8	Project status	This following project activities have been undertaken; • Detail geoscientific studies done • Design of access road and water supply system completed. • Environmental and Social Impact Assessment (ESIA) has been carried out and the NEMA license obtained. • PPP approval obtained from the National Treasury • Community engagement framework established																			
9	Estimated project duration	80 months																			
10	Estimated project cost	<table><tr><td>FY.2017/18</td><td>FY.2018/19</td><td>FY.2019/20</td><td>FY.2020/21</td><td>FY.2021/22</td></tr><tr><td colspan="5">Kshs. Million</td></tr><tr><td>-</td><td>-</td><td>300</td><td>1,917</td><td>2,248</td></tr></table>					FY.2017/18	FY.2018/19	FY.2019/20	FY.2020/21	FY.2021/22	Kshs. Million					-	-	300	1,917	2,248
FY.2017/18	FY.2018/19	FY.2019/20	FY.2020/21	FY.2021/22																	
Kshs. Million																					
-	-	300	1,917	2,248																	
11	Economic and social benefits	• Reliable power supply to customers; • Reduced electricity tariffs due to inclusion of cheaper power mix; • employment opportunities and income generation; • Environmental sustainability through displacement of biomass and fossil fuel by cleaner and environmentally friendly alternatives.																			
12	Sources of financing	• Government exchequer • Donor funding; Italian Development Cooperation (under negotiation)																			

4. AFRICA GEOTHERMAL CENTRE OF EXCELLENCE (AGCE)

1	Project name	Africa Geothermal Centre of Excellence (AGCE)				
2	Project geographic location	Kabarak				
3	Project type	Mega project				
4	Implementing organization	Geothermal Development Company Limited (GDC)				
5	Counties covered	Nakuru				
6	Project purpose	To develop and expand capacity in geothermal technology for the country and the region. Trainings shall target priority human resource knowledge and skills, infrastructure and equipment towards achievement of the 5,000MW from Geothermal energy under vision 2030 national development blueprint.				
7	Brief description of project	The project entails the establishment and operationalization of the Centre of Excellence (AGCE) for the above cited purposes. This includes: • Master plan development • Buildings and constructions for the AGCE • Laboratory, workshops and related/associated equipment and • Curriculum Development				
8	Project status	• Land for the project has already been acquired in Kabarak • Master plan and curriculum has already been developed • Preliminary designs for Labs and AGCE done • Regional and Africa skills gap audit in geothermal energy concluded. • Regional capacity building on priority geothermal skills • Signed Agreement to establish the AGCE in Kenya with key stakeholders • Feasibility study completed • ESIA - Ongoing • Permits/licensing - Granted • Land permits – Granted				
9	Estimated project duration	3 Years				
10	Estimated project cost	FY.2017/18	FY.2018/19	FY.2019/20	FY.2020/21	FY.2021/22
		Kshs. Million				
		~	~	855	513	342
11	Economic and social benefits	• Provision of practical training in all aspects of geothermal energy development • Building Human resources capacity in the region for a robust geothermal industry • Sharing of equipment and expertise in the region				

		• Promotion of regional collaboration through joint research and conferences • Promotion of awareness of the geothermal contribution to the economic and social development of the region • Reduction of the cost of training geothermal experts in the region
12	Sources of financing	• Government exchequer (GoK) and Donor

C. KENYA NUCLEAR ELECTRICITY BOARD

1. Nuclear Power Plant Siting

1	Project Name	Nuclear Power Plant Siting
2	Project Geographic Location	National
3	Project Type	Mega project
4	Implementing Organization	KNEB
5	Counties Covered	Mombasa, Kwale, Tana River, Lamu, Kilifi, Homabay, Kisumu Siaya Busia, Migori, Turkana & Marsabit
6	Project Purpose	To identify internationally acceptable Nuclear Power plant sites following the IAEA guidelines.
7	Brief Description of Project	- This project intends to identify (a) suitable site(s) for nuclear power plants, acquire, secure and develop the best site in preparation for construction of the nuclear power plant. - The activities of site selection involve site surveys, ranking of the sites, and selection of sites based on a set of national criteria, regulatory requirements and quality assurance mechanisms that are currently being developed. - The output of the project is a suitable site with internationally acceptable standards for nuclear power plants. - The project risks include; a. Public acceptance challenges b. Relocation of local community c. High cost of land acquisition - These challenges shall be addressed through public awareness, collaborations with major stakeholders such as the National Assembly and the Senate, the National land Commission, non-disclosure agreements.
8	Project status	Further analysis and ranking of potential sites has been conducted and the best sites and an alternate site for each of the three main regions (Lake Victoria, Lake Turkana and the Kenyan Coastline) have already been selected. A Site and External Events Design Review Mission shall be conducted by the IAEA by end of 2018.
9	Estimated project duration	60 Months

10	Estimated project cost (Total project cost Kshs. 1,500 Million)	FY.2017/18	FY.2018/19	FY.2019/20	FY.2020/21	FY.2021/22
		Kshs "Million"				
		130	150	200	603	355
11	Economic and social benefits	a) The process will enable the country to come up with a suitable site for a Nuclear Power plant. b) It will enable stakeholders to buy in the idea of safe use of nuclear technology c) The studies will improve vendors interests and confidence on Kenya's Nuclear Power programme. d) Job opportunities for Kenyans during site characterization. e) Socio-economic benefits to the local communities.				
12	Sources of financing	GoK, International Atomic Energy Agency (IAEA)				

2. Curriculum Development for Nuclear Courses

1	Project Name	Curriculum development for Nuclear Courses
2	Project Geographic Location	National
3	Project type	Medium
4	Implementing Organization	KNEB
5	Counties Covered	47
6	Project Purpose	A Nuclear Power Program is knowledge intensive. The NPP comprises three main institutions: Promoter, Operator and a regulator. These three organizations require personnel with various skills and professional competencies. KNEB has commenced the training of such personnel.
7	Brief Description of Project	The project is aimed at planning, developing capacity and training Kenyans on nuclear related courses in preparation for construction and operation of Kenya's Nuclear Power Plant

8	Project Status	The Board has rolled out annual training programs targeting Kenyans for training in various nuclear fields so as to build adequate capacity for the support of the country's nuclear power program. The trainings comprise of both short and long term programs in partnership with local and international institutions.				
9	Estimated Project Duration	Continuous				
10	Estimated project cost (Total project cost Kshs. 4,000 Million)	FY.2017/18	FY.2018/19	FY.2019/20	FY.2020/21	FY.2021/22
		Kshs "Million"				
		-	50	80	400	400
11	Economic and social benefits	a) Duly trained Kenyans & informed public on the benefits of nuclear energy b) Public acceptance of use of nuclear energy in electricity generation c) Career opportunities for young Kenyans in the nuclear field, manufacturing field and service industry				
12	Sources of financing	GoK				

3. Nuclear Policy and Legislation

1	Project name	Nuclear Policy and Legislation
2	Project Geographic Location	National
3	Project Type	Medium
4	Implementing Organization	KNEB
5	Counties Covered	47
6	Project Purpose	To develop Policy, legal and institutional framework for peaceful uses of nuclear technology in Kenya.

7	Brief Description of Project	The project involves addressing four key areas: a) National Nuclear Policy The national nuclear energy policy shall address policy gaps in peaceful utilization of nuclear technology. b) National Nuclear Regulatory Law The enactment of draft Nuclear Regulatory Bill 2017 will address legal, institutional and regulatory gaps for safe peaceful use of nuclear for electricity generation, among other uses outlined in the Policy. c) Harmonization of National Laws with Nuclear Regulatory Law The outcome of this process will ensure smooth regulation of the sector by reducing compliance and regulatory challenges. d) Accession to Nuclear Safety Conventions. The Conventions are: a. The Convention on Nuclear Safety (CNS) b. The Convention on Early Notification of a Nuclear Accident; c. The Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency; and d. The Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management.				
8	Project Status	• Nuclear Regulatory bill has been approved by cabinet and has been forwarded to National Assembly for debate. • Public participation on convention of nuclear safety has been conducted.				
9	Estimated Project Duration	60 Months				
10	Estimated Project Cost (Total)	FY.2017/18	FY.2018/19	FY.2019/20	FY.2020/21	FY.2021/22

	Project Cost Kshs. 3,000 Million)	Kshs “Million”				
		-	80	120	520	800
11	Economic and Social Benefits	- The development of a National Nuclear Policy and Nuclear Legal and Regulatory framework will benefit the Government of Kenya by setting policy and legal foundations for safe utilization of peaceful uses of Nuclear Technology. - Job creation for the young Kenyans interested in undertaking training in science and application.				
12	Sources of Financing	GoK				

4. Strategic Environmental Assessment for Kenya’s Nuclear Power Programme

1	Project Name	Strategic Environmental Assessment for Kenya’s Nuclear Power Programme				
2	Project Geographic Location	National				
3	Project Type	Medium				
4	Implementing Organization	KNEB & NEMA				
5	Counties Covered	47				
6	Project Purpose	SEA is legal requirement for all large projects in order to assess the strategic and environmental viability of a programme as well as provide several alternatives to the programme.				
7	Brief Description of Project	The project involves screening, scoping and analysis of state of the environment, determination of baseline environmental data and public engagement for effective decision making in sustainable development of nuclear power program.				
8	Project Status	- SEA Scoping report has been developed - Public and stakeholder engagement is ongoing.				
9	Estimated Project Duration	36 Months				
10	Estimated Project	FY.2017/18	FY.2018/19	FY.2019/20	FY.2020/21	FY.2021/22

	Cost (Total Project Cost Kshs. 460 Million)	Kshs “Million”				
		180	100	120	40~	~
11	Economic and Social Benefits	a) Public acceptance of the Nuclear Power project b) A basis for the commencement of an Environmental Impact Assessment for the nuclear power project. c) Enhanced local expertise in nuclear energy.				
12	Sources of Financing	GoK				

D. KENYA ELECTRICITY TRANSMISSION COMPANY (KETRACO)

1. Kenya Power Transmission Expansion Project

1	Project Name	Kenya Power Transmission Expansion Project
2	Project Geographic Location	Diverse-Kajiado/Narok/Bomet/Migori/Kisii
3	Project Type	Mega Project
4	Implementing Organization	KETRACO
5	Counties Covered	KAJIADO, NAROK, BOMET, KISII, MIGORI
6	Project Purpose	The project is aimed at improving the quality of supply within the entire Kajiado, Narok, Migori and Bomet regions. The project will also improve voltage profiles within these counties. There will be increased reliability of supply of electrical energy by ensuring redundancy of supply as well as a realization of the overall development of the Kajiado (Merueshi,Loitoktok) ,Narok, Migori and Bomet regions due to availability of reliable electrical energy. Improved and increase access to high voltage reliable electricity will support the vision 2030 and the Big 4 Agenda initiative.
7	Brief Description of Project	The Project consists of 120km 132kV Sultan Hamud – Oloitoktok Single Circuit line, 40km 220kV Isinya – Konza Double Circuit line and 50km 132kV Awendo – Isebania Double Circuit line alongside associated new substations at Oloitoktok, Konza and Isebania. Substations extensions will be undertaken in the existing Isinya, Sultan – Hamud and Awendo substations.132kV Double circuit transmission line associated substations. The major project risk is the acquisition of the right of way that could lead to delay in project implementation time and cost overruns. KETRACO aims at recruiting way leave officers and Community mobilizers in the areas where the line traverses to help solve the way leave challenges as they arise. Involvement of the county government and local administration is also considered to facilitate the opening up of the project route.
8	Project Status	Implementation Stage (Total advance payment was 20%; 15% GOK portion paid; 5% Exim Bank portion in process, Resettlement Action Plan (RAP) report not done, Environmental Social Impact Assessment (ESIA) report submitted to NEMA and licence issued. Project has been registered with the National Construction Authority –NCA)
9	Estimated Project	30 months

	Duration					
10	Estimated Project Cost (Total Project Cost Kshs.13,228 Million)	FY.2017/18	FY.2018/19	FY.2019/20	FY.2020/21	FY.2021/22
		Kshs "Million"				
		1,525	-	300	5,341	
11	Economic and Social Benefits	Access to affordable electricity, job creation, enhancing ICT through the fibre network on the transmission line. Simulate industrial and agricultural growth through establishment of industries.				
12	Sources of Financing	GOK (Treasury) & EXIM Bank of China				

2. Eastern Electricity Highway Ethiopia (Kenya Power Systems Interconnection Project)

1	Project Name	Eastern Electricity Highway Ethiopia (Kenya Power Systems Interconnection Project)
2	Project Geographic Location	Rift Valley through North Eastern to the Kenya – Ethiopia Boarder
3	Project Type	Mega project
4	Implementing Organization	KETRACO
5	Counties Covered	MOYALE, MARSABIT, SAMBURU, ISIOLO, LAIKIPIA, MYANDARUA AND NAKURU
6	Project Purpose	The project is an interconnector project that will facilitate power transmission between Ethiopia and Kenya for the export of up to 2000MW. It also aims at regional integration to realize sustainable growth and development. The project is in line with the Big 4 Agenda initiative.
7	Brief Description of Project	The project consists of approximately 1,100km, 500kV bipolar HVDC transmission line between Sodo in Ethiopia and Suswa in Kenya and the construction of the Converter Stations in Suswa and the 400/220kV Suswa substation. It also includes the Kenya system reinforcement component which includes the construction of the Isinya 400/220kV substation and the addition of a 90MVA transformer at Nairobi North substation. The major project risk is the acquisition of right of way that could lead to delays in project implementation and cost overruns. KETRACO has engaged in certain instances the National Land

		Commission to assist with independent valuation in cases where compensation disputes with the community have arisen, at the same time way leave officers will be recruited and dedicated to solving way leave issues as they arise. The other risk is the delay to commission Isinya 400KV substation due to the delay of the Mariakani 400kv substation and the Mombasa Nairobi project.				
8	Project Status	Ongoing: Transmission line (Kenya side 612km, 96% complete.) Substations 51% complete				
9	Estimated Project Duration	30 Months				
10	Estimated Project Cost Kshs. Million 63,728	FY.2017/18	FY.2018/19	FY.2019/20	FY.2020/21	FY.2021/22
		Kshs "Million"				
		6,949	6,655	26,556	5,800	-
11	Economic and Social Benefits	Access to affordable electricity, promote use of clean energy sources from Ethiopia and reduce dependence on fossil fuel based thermal energy sources, job creation, enhancing ICT through the fibre network on the transmission lines				
12	Sources of Financing	World Bank, French Development Agency (AFD), African Development Bank (AfDB) and Government of Kenya				

3. Kenya Power Distribution System Modernization and Strengthening (GARSEN-HOLA-GARISSA)

1	Project Name	Kenya Power Distribution System Modernization and Strengthening (GARSEN-HOLA-GARISSA)
2	Project Geographic Location	COAST, NORTH EASTERN
3	Project Type	MEGA PROJECT
4	Implementing Organization	KETRACO
5	Counties Covered	TANA RIVER AND GARISSA.
6	Project Purpose	The project will extend HV grid to Hola and provide alternative supply for Garissa (from Coast) hence increase grid power access and capacity to these areas. In addition to increasing supply reliability and quality displacement of the diesel generator located in

		Hola. Improved and increase access to high voltage reliable electricity will support the vision 2030 and the Big 4 Agenda initiative.				
7	Brief Description of Project	The project consists of 240km, 220kV single circuit transmission line, and construction of a bay extensions at Garissa and Garsen substations and new substation at Hola and Bura. The project is meant to provide HV supply to Hola in addition to alternative source of supply for Garissa. The major project risk is the acquisition of right of way and delayed financing.				
8	Project Status	Ongoing (95% of Advance payment has been done, Resettlement Action Plan (RAP) report completed. Scoping of substation land at Hola and Bura complete, awaiting response from Tana River County Government. Project has been registered with NCA)				
9	Estimated Project Duration	24 Months				
10	Estimated Project Cost Kshs. Million 10,415	FY.2017/18	FY.2018/19	FY.2019/20	FY.2020/21	FY.2021/22
		Kshs “Million”				
		1,774	-	300	3,550	4,265
11	Economic and Social Benefits	High GDP growth maintained and improved availability of reliable and sustainable electricity for economic growth. It is meant to upgrade the existing irrigation schemes around Bura and Hola.				
12	Sources of Financing	Exim China, GoK				

4. Kamburu- Embu- Thika Transmission Line 220 KV (KAMBURU-EMBU-KIBIRIGWI-THIKA and 132/33kV UPLANDS SUBSTATION)

1	Project Name	Kamburu- Embu- Thika Transmission Line 220 KV (KAMBURU-EMBU-KIBIRIGWI-THIKA and 132/33kV UPLANDS SUBSTATION)
2	Project Geographic Location	EASTERN,CENTRAL,NAIROBI (MT. KENYA AND NAIROBI REGIONS)
3	Project Type	MEGA PROJECT
4	Implementing Organization	KETRACO
5	Counties Covered	EMBU,KIRINYAGA,NYERI,MURANGA,KIAMBU

6	Project Purpose	The project will supply the future load of Uplands and to unload the Limuru substation thereby coping with additional demand within the Nairobi region. The project will also provide alternative electricity evacuation path from Eastern Hydros, relieve the existing 132kV Masinga-Kiganjo line and reinforce the 132kV network in these regions. It is aimed that this will increase access to reliable electricity in line with vision 2030 and the Big 4 Agenda initiative.				
7	Brief Description of Project	The project involves construction of 132kV/66kV substation with 2x60MVA transformers at Uplands, and establishment of a 220kV double circuit line from Kamburu-Thika through Embu (Kutus) and Kibirigwi with associated 220/132kV substations. The project is expected to strengthen the grid in the Mt Kenya and Nairobi region and extend the HV grid to Limuru. The major project risk is lack of sufficient funding and delayed acquisition of wayleaves.				
8	Project Status	Ongoing				
9	Estimated Project Duration	24 Months (excluding period required for financing and procurement)				
10	Estimated Project Cost Kshs. Million 14,359	FY.2017/18	FY.2018/19	FY.2019/20	FY.2020/21	FY.2021/22
		Kshs "Million"				
		2,651	~	300	4,194	6,114
11	Economic and Social Benefits	Increased power reliability, reduced cost and increased quality of power, job creation, enhancing ICT through the fibre network on the transmission lines.				
12	Sources of Financing	External sources (Multilateral/Bilateral) - Exim Bank of China.				

5. Kenya Electricity Expansion Project

1	Project Name	Kenya Electricity Expansion Project
2	Project Geographic Location	Western, Eastern & North eastern parts of Kenya
3	Project Type	Mega Project
4	Implementing Organization	KETRACO
5	Counties Covered	UASIN GISHU, TRANS NZOIA, KISII, MIGORI, HOMABAY, MACHAKOS, KITUI, GARISSA & TANA RIVER

6	Project Purpose	Government of Kenya plans to expand the transmission network and install new 132/33 kV substations across the country with the aim of reducing technical losses and improving voltage conditions, thereby coping with additional demand. It is aimed that this will increase access to electricity in line with vision 2030 .In addition it will also provide alternative electricity supply paths to increase reliability and improve power quality. This project therefore aims to construct approximately 342Km of 132KV transmission lines and establish 132/33KV substations and bays in different geographic regions to meet this need.				
7	Brief Description of Project	The Project comprises; ✓ 233km, 132kV Kindaruma – Mwingi – Garissa transmission line, 132/33kV Mwingi substation, 132kV Kindaruma substation and 132/33/11kV Garissa substation. ✓ 65km, 132kV Eldoret – Kitale transmission line, 132/33kV Kitale substation and 132kV Eldoret bay extension. ✓ 44km, 142kV Kisii – Awendo transmission line, 132/33kV Awendo substation and 132kV Kisii bay extension. The major risk has been the acquisition of right of way. KETRACO is constantly engaging with the project affected persons to ensure that there are no stoppages. We have also collaborated with the National Land Commission in cases where compensation disputes have arisen.				
8	Project Status	Completed				
9	Estimated Project Duration	Transmission line – 18 months, Substations – 24months				
10	Estimated Project Cost Kshs. Million 4,529	FY.2017/18	FY.2018/19	FY.2019/20	FY.2020/21	FY.2021/22
		Kshs “Million”				
		257	~	1,237		
11	Economic and Social Benefits	Stimulating industrial and agricultural activities, creation of jobs and increased power reliability.				
12	Sources of Financing	World Bank & GOK				

6. Kenya Power Transmission System Improvement Project

1	Project Name	Kenya Power Transmission System Improvement Project				
2	Project Geographic Location	Eastern and Rift Valley Region				
3	Project Type	Mega project				
4	Implementing Organization	KETRACO				
5	Counties Covered	NAROK, BOMET, UASIN GISHU, BARINGO, ELGEYO MARAKWET, LAIKIPIA, EMBU, KITUI, MAKUENI				
6	Project Purpose	The project will increase supply capacity through a reduction of system losses and provide alternative electricity path to increase reliability and improve quality of power in the regions.				
7	Brief Description of Project	The project consists of 431km, 132kV single circuit transmission line, and construction of eight new 132/33kV substations, two 132kV switching stations and the extension of three 132/33kV existing substations. The major project risk is the acquisition of right of way that could lead to delays in project implementation. KETRACO has engaged in certain instances the National Land Commission to assist with independent valuation in cases where compensation disputes with the community have arisen, at the same time way leave officers have been recruited and are dedicated to solving way leave issues as they arise.				
8	Project Status	Ongoing: Transmission Line (278km out of 431km yet to be strung) Substations (100% complete)				
9	Estimated Project Duration	28 months				
10	Estimated Project Cost Kshs. Million 10,749	FY.2017/18	FY.2018/19	FY.2019/20	FY.2020/21	FY.2021/22
		Kshs "Million"				
		145	1,125	1,124		
11	Economic and Social Benefits	High GDP growth maintained and improved availability of reliable and sustainable electricity for economic growth				
12	Sources of Financing	African Development Bank and Government of Kenya				

7. Lamu- Kitui – Nairobi East 400kV Transmission Project

1	Project Name	Lamu- Kitui – Nairobi East 400kV Transmission Project
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2	Project Geographic Location	Nairobi, Eastern & Coast Region				
3	Project Type	Mega Project				
4	Implementing Organization	KETRACO				
5	Counties Covered	LAMU, TANA RIVER, KITUI, MACHAKOS, NAIROBI				
6	Project Purpose	The project is intended at evacuating 960MW (which is a part of the 5000+MW) of power from proposed Lamu coal plant to Nairobi. The project will also evacuate power from the Kitui coal plant once this coal power plant is installed. <i>(the line to evacuate power from Kitui line will be completely a new line)</i>				
7	Brief Description of Project	The project comprises of construction of 540km of 400kV double circuit transmission line and associated substation split in three lots. Lot A comprising the development of 400kV double circuit transmission line from proposed Nairobi East Substation to Kitui and also construction of 20km 220kV double circuit transmission line from the Lamu coal plant to the existing 220kV Lamu (Hindi) Substation. Lot B entails construction of a 400kV double circuit transmission line from Kitui to a Substation near the proposed coal plant in Lamu. Lot C covers the construction of two 400kV/220kV substations in Nairobi East and one in Lamu near the proposed coal plant and extension of the existing substation at Hindi. The major project risk foreseen is in the acquisition of right of way that could lead to delays in project implementation. KETRACO will engage National Land Commission to assist with independent valuation in cases where compensation disputes with the community arises, at the same time project dedicated way leave officers will be recruited to deal with way leave issues as they arise				
8	Project Status	Ongoing (Supervision consultant contract awarded. Resettlement Action Plan (RAP) report completed and Environmental Social Impact Assessment (ESIA) report submitted to NEMA. Contracts with EPC Contractors signed.)				
9	Estimated Project Duration	24 months from commencement date which expected to be June 2019.				
10	Estimated Project Cost Kshs million 35,452	FY.2017/18	FY.2018/19	FY.2019/20	FY.2020/21	FY.2021/22
		Kshs "Million"				
				14,802	11,050	9,600
11	Economic and	Access to electricity, job creation, Spurs economic growth				

	Social Benefits	
12	Sources of Financing	EPC+ Financing (<i>Contractors to come up with their financiers</i>)

8. Lessos-Tororo Project

1	Project Name	Lessos-Tororo Project				
2	Project Geographic Location	Western part of Kenya				
3	Project Type	Mega project				
4	Implementing Organization	KETRACO				
5	Counties Covered	NANDI, KAKAMEGA, BUNGOMA AND BUSIA				
6	Project Purpose	The project is part of the bigger Northern Corridor project and will facilitate power trade between partner states i.e. Kenya, Uganda and Rwanda. It also aims at regional integration (Northern Corridor Integration Projects).				
7	Brief Description of Project	The project consists of 132.5km, 400kV double circuit transmission line and the extension of the 220/132kV Lessos substation. The major project risk is the acquisition of right of way that could lead to delays in project implementation and cost overruns. KETRACO has engaged in certain instances the National Land Commission to assist with independent valuation in cases where compensation disputes with the community have arisen, at the same time way leave officers have been recruited and are dedicated to solving way leave issues as they arise.				
8	Project Status	Ongoing (Transmission Line = 37%, Substation = 40%. Contractor has obtained a stay order on the sites while seeking to reverse decision to encash guarantees. Stay order-delaying engagement of a new contractor. Arbitration in progress.)				
9	Estimated Project Duration	18 months				
10	Estimated Project Cost Kshs. Million 8,809	FY.2017/18	FY.2018/19	FY.2019/20	FY.2020/21	FY.2021/22
		Kshs "Million"				
		860	100	1,782	1,309	

11	Economic and Social Benefits	Access to affordable electricity, job creation, enhancing ICT through the fibre network on the transmission lines
12	Sources of Financing	African Development Bank and Government of Kenya

9. Loiyangalani-Suswa 400kV Transmission line

1	Project Name	Loiyangalani-Suswa 400kV Transmission line				
2	Project Geographic Location	Northern part of Kenya				
3	Project Type	Mega project				
4	Implementing Organization	KETRACO				
5	Counties Covered	NAKURU, NYANDARUA, LAIKIPIA, SAMBURU AND MARSABIT				
6	Project Purpose	The project is part of the 5000MW + and is expected to evacuate the 300MW wind generation by Lake Turkana Wind Power project.				
7	Brief Description of Project	The project consists of 436km, 400kV double circuit transmission line and the establishment of 400kV Loiyangalani substation. The major project risk is the settlement of the pending bills.				
8	Project Status	Completed				
9	Estimated Project Duration	18 months				
10	Estimated Project Cost Kshs. Million 28,907	FY.2017/18	FY.2018/19	FY.2019/20	FY.2020/21	FY.2021/22
		Kshs "Million"				
		6,364	9,608			
11	Economic and Social Benefits	Improving generation mix for affordable electricity, job creation, enhancing ICT through the fibre network on the transmission lines				
12	Sources of Financing	Government of Spain, Deutsche Bank and Government of Kenya				

10. Machakos-Konza-Isinya-Namanga

1	Project Name	Machakos-Konza-Isinya-Namanga				
2	Project Geographic Location	Eastern (Machakos, Konza) and Rift valley (Kajiado, Namanga)				
3	Project Type	Mega project				
4	Implementing Organization	KETRACO				
5	Counties Covered	MACHAKOS, MAKUENI, KAJIADO				
6	Project Purpose	The project is aimed at improving reliability and access of both domestic and industrial power in the counties of Machakos, Makueni, and Kajiado and especially the towns of Machakos, Konza, Isinya, Kajiado, Ilbisil and Namanga. Improved and increase access to high voltage reliable electricity will support the vision 2030 and the Big 4 Agenda initiative.				
7	Brief Description of Project	The project consists of construction of construction of four new 132/33kV Substation at Machakos, Konza, Isinya and Namanga and construction of 13km of 132kv transmission line between Machakos and Konza and 92km of 132Kv Transmission Line between Isinya and Namanga. This will improve reliability and access to power within the project region. The project is currently 45% complete and the major risk is the acquisition of right of way especially the Isinya-Namanga section that has led to delays in project implementation and cost overruns. KETRACO has engaged in certain instances the National Land Commission to assist with independent valuation in cases where compensation disputes with the community have arisen, at the same time way leave officers have been recruited and are dedicated to solving way leave issues as they arise.				
8	Project Status	Ongoing Transmission Line: (94km out of 153km pending) Substations: Complete				
9	Estimated Project Duration	18 months				
10	Estimated Project Cost Kshs. Million 4,342	FY.2017/18	FY.2018/19	FY.2019/20	FY.2020/21	FY.2021/22
		Kshs "Million"				
		713	539	663	208	
11	Economic and Social Benefits	Access to reliable, quality and affordable electricity, Urbanization e.g. Konza ICT City, job creation, enhancing ICT through the fibre network on the transmission lines				
12	Sources of	EXIM BANK OF INDIA				

	Financing	
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11. MARIAKANI 400/132KV SUBSTATION

1	Project Name	MARIAKANI 400/132KV SUBSTATION				
2	Project Geographic Location	COAST				
3	Project Type	Mega project				
4	Implementing Organization	KETRACO				
5	Counties Covered	KILIFI				
6	Project Purpose	The substation is aimed at stepping down/up power from 400kV to 220kV on the Mombasa – Nairobi Transmission line thus enabling the Isinya – Mariakani section be energized at 400kV. This will allow additional power flow from the geothermal power plants in Olkaria to the coast area, thus displacing the more expensive thermal diesel generation. The substation will also be connected to the Dongo Kundu Special Economic Zone. The project is in addition aimed at increasing access to high voltage electricity. Improved and increase access to high voltage reliable electricity will support the vision 2030 and the Big 4 Agenda initiatives				
7	Brief Description of Project	Project will involve the construction of a 400/220kV substation Risks a) Funding of this project is dependent on savings from Ethiopia Kenya				
8	Project Status	Processing Advance Payment				
9	Estimated Project Duration	22months				
10	Estimated Project Cost Kshs. Million 2,960	FY.2017/18	FY.2018/19	FY.2019/20	FY.2020/21	FY.2021/22
		Kshs "Million"				
		107	57	1,598	1,100	
11	Economic and Social Benefits	Increased power reliability. Reduced cost and increased quality of power, job creation, enhancing ICT through the fibre network on the transmission lines.				

12	Sources of Financing	ADB (saving from Ethiopia Kenya line) and GOK
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12. Mombasa-Nairobi Transmission Line Project

1	Project Name	Mombasa-Nairobi Transmission Line Project				
2	Project Geographic Location	Eastern				
3	Project Type	Mega project				
4	Implementing Organization	KETRACO				
5	Counties Covered	KILIFI, KWALE, VOI, MAKUENI, KAJIADO AND NAIROBI				
6	Project Purpose	The Project, Nairobi-Mombasa line will strengthen the transmission backbone between Mombasa and the Western part of the country. This Project will increase the transmission capacity between Mombasa and Nairobi in tandem with the planned generation expansion, partly because Nairobi is the major national load center accounting for over half of the national electricity demand.				
7	Brief Description of Project	The project consists of 445.6 km, 400kV, 41.3km 220kV double circuit transmission line and the extension of the 220kV Embakasi and Rabai substations. The major project risk is the settlement of the pending bills.				
8	Project Status	Completed, with pending bills relating to compensation to PAPs and contractual claims				
9	Estimated Project Duration	27 months				
10	Estimated Project Cost Kshs. Million 24,548	FY.2017/18	FY.2018/19	FY.2019/20	FY.2020/21	FY.2021/22
		Kshs "Million"				
		2,201	200	5,131		
11	Economic and Social Benefits	Improving the system reliability which will promote of Industries, Access to affordable electricity, job creation, enhancing ICT through the fibre network on the transmission lines				
12	Sources of Financing	AfDB, EIB, AFD and GOK.				

13. Kenya – Tanzania Power Interconnection Project

1	Project Name	Kenya – Tanzania Power Interconnection Project
2	Project Geographic Location	South Western part of Kenya
3	Project Type	Mega project
4	Implementing Organization	KETRACO
5	Counties Covered	KAJIADO
6	Project Purpose	The objective of the project is to improve the supply of electricity in Kenya and Tanzania and other East African Power Pool (EAPP) countries. The power interconnection between Tanzania and Kenya is of strategic importance to the East African region and will in the long run ensure power trade between the Southern African Power Pool in the south and Sudan and Egypt in the north. The ultimate development objective is in line with the vision 2030 of promoting access to affordable energy for the Kenyan people, regional integration, social and economic development. The project will ultimately contribute to poverty reduction in the region.
7	Brief Description of Project	The project involves the construction of about 510 km of high voltage alternating current (HVAC) 400 kV transmission line, of which about 414km are located in Tanzania and about 96 km in Kenya. The project also includes on the Tanzanian part, the construction of a 400 kV substation in Arusha and extension of Singida substation. The transmission line is intended to facilitate the transfer of power up to a maximum capacity of 2000 MW. Considering the complexity of energy trading, and dynamic changes in the power sector in East Africa, an interconnection tariff study and standard Power Purchase Agreement (PPA) will be done for the project as well as for the region. Tanzania has already expressed interest in purchasing 200MW of power from Ethiopia through this line. A major risk is the availability of wayleaves for the project. This risk is usually tied to availability of counterpart funds for resettlement. To address this risk, the project team will work to give timely input to decision makers at the national treasury who require detailed and accurate work plans in line with the GoKs program based budgeting (PBB) procedures.
8	Project Status	Ongoing (Overall - 28% complete)
9	Estimated Project	22 months

	Duration					
10	Estimated Project Cost Kshs. million 3,792	FY.2017/18	FY.2018/19	FY.2019/20	FY.2020/21	FY.2021/22
		Kshs "Million"				
		870	600	2,455		
11	Economic and Social Benefits	Access to affordable electricity across the region, job creation, enhancing ICT through the fibre network on the transmission line				
12	Sources of Financing	African Development Bank and Government of Kenya for counterpart funds for resettlement				

14. NANYUKI-ISIOLO-MERU ELECTRIFICATION PROJECT

1	Project Name	NANYUKI-ISIOLO-MERU ELECTRIFICATION PROJECT
2	Project Geographic Location	EASTERN AND MOUNT KENYA REGION
3	Project Type	Mega project
4	Implementing Organization	KETRACO
5	Counties Covered	LAIKIPIA, MERU AND ISIOLO
6	Project Purpose	The project will reduce technical losses in the transmission line and improving voltage conditions within the entire Laikipia, Meru and Isiolo counties thereby coping with additional demand. It is aimed that this will increase access to electricity in line with vision 2030. The project will also provide alternative electricity supply paths to increase reliability and improve power quality. Kenya Electricity Transmission Company therefore plans to construct approximately 105Km of 132KV transmission lines and establishment of 132/33KV substation in Isiolo and bays in Nanyuki and Meru.
7	Brief Description of Project	The project involves construction of 105km of single circuit 132kV transmission line from Nanyuki to Meru with a 132kV/33kV substation at Isiolo and bay extensions at Nanyuki and Meru substations. The project is expected to strengthen the grid in the eastern and Mount Kenya region and extend the grid to Isiolo. The following are the projects major risks and possible mitigation measures.

		➤ Delay in project implementation and cost overruns on the transmission line component of the project due to acquisition of right of way. ➤ KETRACO is engaged in negotiations with the stakeholders (community, political leaders, MOE&P, County Government) as the way leave officers recruited try to solve way leave issues as they arise on the ground				
8	Project Status	Ongoing (Substations – Complete, Transmission Line: 93%)				
9	Estimated Project Duration	20 months				
10	Estimated Project Cost Kshs. Million 5,588	FY.2017/18	FY.2018/19	FY.2019/20	FY.2020/21	FY.2021/22
		Kshs “Million”				
		188	500	2,305		
11	Economic and Social Benefits	Increased power reliability. Reduced cost and increased quality of power, job creation, enhancing ICT through the fibre network on the transmission lines.				
12	Sources of Financing	KBC BANK, Belgium & GOK				

15. Turkwel-Ortum-Kitale TL and SS Project

1	Project Name	Turkwel-Ortum-Kitale TL and SS Project
2	Project Geographic Location	Trans Nzoia and Pokot areas
3	Project Type	Mega project
4	Implementing Organization	KETRACO
5	Counties Covered	TRANS NZOIA AND WEST POKOT
6	Project Purpose	The project is intended to establish an alternative evacuation path for the Turkwel generation plant. It is also intended to supply a new cement plant to be set up at Ortum. Also to increase access to power to the populace around Ortum and improve the quality and reliability of power especially around Kitale.
7	Brief Description of Project	The project consists of 138kms of 220kV single circuit transmission line and the construction of a 220/33kV substation at Ortum and

		220/132kV substation at Kitale. The major project risks are wayleave compensation challenges arising from community expectations and inadequate Exchequer allocation.				
8	Project Status	Ongoing (TL: 42km out of 138km strung, SS: 57% complete)				
9	Estimated Project Duration	18 months				
10	Estimated Project Cost (Total Project Cost Kshs. 4,597 Million)	FY.2017/18	FY.2018/19	FY.2019/20	FY.2020/21	FY.2021/22
		Kshs "Million"				
		312	786	315	-	-
11	Economic and Social Benefits	Improved reliability due to alternative path for Turkwel power evacuation, supply to new cement industry, improved access to power, reliable and quality power to the nearby counties, job creation, enhancing ICT through the fibre network on the transmission lines				
12	Sources of Financing	Exim Bank of India and Government of Kenya				

16. Sondu-Homabay-Awendo Project

1	Project Name	Sondu-Homabay-Awendo Project
2	Project Geographic Location	South Nyanza
3	Project Type	Mega project
4	Implementing Organization	KETRACO
5	Counties Covered	KISUMU, HOMABAY AND MIGORI
6	Project Purpose	The project is aimed at improving the quality of supply within the entire south Nyanza region. The project will also improve voltage profiles within the Kisumu, Homabay and Migori counties. Increased reliability of supply of electrical energy by ensuring redundancy of supply either from Sondu Hydropower generating station or Awendo which is fed from Kegati. Improved and increase access to high voltage reliable electricity will support the vision 2030

		and the Big 4 Agenda initiative.				
7	Brief Description of Project	The Project consists of a 106km, 132kV Single circuit transmission line and 132/33kV Substations construction/extensions at Sondu, Homabay and Awendo. The major project risk is the acquisition of the right of way that could lead to delay in project implementation time and cost overruns. There is also required funds to facilitate change of scope at Sondu (Thurdibuoro) in order to connect to existing generators.				
8	Project Status	Commenced, Ndhiwa Substation complete, Awendo substation Complete, Sondu (Thurdibuoro) Substation 0%, stringing 36% complete.				
9	Estimated Project Duration	24 months				
10	Estimated Project Cost (Total Project Cost Kshs 3,171 Million)	FY.2017/18	FY.2018/19	FY.2019/20	FY.2020/21	FY.2021/22
		Kshs "Million"				
		687	915	1,193	-	-
11	Economic and Social Benefits	Access to affordable electricity, job creation, enhancing ICT through the fibre network on the transmission line. Simulate industrial and agricultural growth through establishment of industries (example is the fish processing industries)				
12	Sources of Financing	KBC Bank Belgium and GOK				

17. Rabai-Malindi- Garsen- Lamu

1	Project Name	Rabai-Malindi- Garsen- Lamu Shunt Reactors Project
2	Project Geographic Location	Coast Region
3	Project Type	Mega project
4	Implementing Organization	Kenya Electricity Transmission Company Limited (KETRACO)
5	Counties Covered	KILIFI, TANA RIVER AND LAMU
6	Project Purpose	The project will allow the energization of Lamu 220kV/33kV Substation by regulating voltage levels on the transmission line. The commissioning of the Lamu (Hindi) substation will eliminate the

		problem of perennial power shortages in Lamu main land as well as facilitate the connection of Lamu Island to the national grid.				
7	Brief Description of Project	The project is intended at helping regulate the Voltage levels on the Rabai-Malindi-Garse-Lamu transmission lines which is major impediment to commissioning Lamu Substation. The project entails the designing, construction, erection and commissioning of 33kV transmission Shunt reactors at Malindi, Garsen and Lamu Substations.				
8	Project Status	Complete				
9	Estimated Project Duration	60 months				
10	Estimated Project Cost (Total Project Cost Kshs. 10,064Million)	FY.2017/18	FY.2018/19	FY.2019/20	FY.2020/21	FY.2021/22
		Kshs "Million"				
		52	-	40		
11	Economic and Social Benefits	Access to electricity, job creation, spurs economic growth, Connect Lamu County to the national grid.				
12	Sources of Financing	Government of Kenya				

18. RABAI – BAMBURI - KILIFI

1	Project Name	RABAI – BAMBURI - KILIFI
2	Project Geographic Location	COAST REGION
3	Project Type	MEGAPROJECT
4	Implementing Organization	KETRACO
5	Counties Covered	KILIFI
6	Project Purpose	The project will increase access and connectivity through reinforcement of transmission and distribution grid. It will also improve system reliability and security of supply in North Coast and Kilifi areas. The line will improve the quality of power serving the cement factories, industries, hotels and residential areas. Improved and increase access to high voltage reliable electricity is in line the

		vision 2030 and the Big 4 Agenda initiative.				
7	Brief Description of Project	The project entails establishment of a new 132kV substation at Bamburi and extending/improving the Rabai, Existing Bamburi and Kilifi substations, approximately 54km double circuit line from existing Rabai to Bamburi and Kilifi. Risks The following is the project's major risk; a) Lack of budget allocation which is likely to delay critical activities necessary for wayleave acquisition and commencement of the project.				
8	Project Status	Commencement (Final Conditions precedent for the loan agreement to be effective in progress)				
9	Estimated Project Duration	27 months				
10	Estimated Project Cost (Total Project Cost Kshs. 3,306 Million)	FY.2017/18	FY.2018/19	FY.2019/20	FY.2020/21	FY.2021/22
		Kshs "Million"				
		-	-	1,645	1,070	591
11	Economic and Social Benefits	Increased power reliability. Reduced cost and increased quality of power, job creation, enhancing ICT through the fibre network on the transmission lines				
12	Sources of Financing	External Sources (Spanish Government) and GoK				

19. Menengai-Soilo

1	Project Name	Menengai-Soilo
2	Project Geographic Location	Rift valley (Nakuru)
3	Project Type	5000+MW Project
4	Implementing Organization	KETRACO
5	Counties Covered	NAKURU
6	Project Purpose	The project is aimed at evacuating 105MW of geothermal power from proposed Menengai Geothermal Power Plants to the national

		grid via Soilo Substation with a view of improving system reliability and reduction in power costs.				
7	Brief Description of Project	The project consists of construction of a new 132kV Substation at Menengai, approximately 13km of 132kV double circuit transmission line between proposed Menengai substation & existing 132/11kV Soilo (Nakuru Pipeline) substation and extension works on the existing Soilo substation. The project is aimed at evacuating 105MW of power from the proposed Menengai geothermal power plants to be developed by IPPs contracted by GDC. It is hoped that evacuation of this power to the national grid will result in improved reliability of the system and by extension contribute towards reduced power costs.				
8	Project Status	Complete				
9	Estimated Project Duration	12 months				
10	Estimated Project Cost (Total Project Cost Kshs. 1,868 Million)	FY.2017/18	FY.2018/19	FY.2019/20	FY.2020/21	FY.2021/22
		Kshs "Million"				
		170	100	224	-	-
11	Economic and Social Benefits	Addition of green energy to the national grid resulting in enhanced system reliability which in turn brings about increased accessibility to power, quality supplies, affordable electricity, and enhanced ICT through the fibre network on the transmission lines				
12	Sources of Financing	GoK				

20. Nairobi Ring and Associated Substations

1	Project Name	Nairobi Ring and Associated Substations
2	Project Geographic Location	Nairobi, Central and Rift Valley part of Kenya
3	Project Type	Mega project
4	Implementing Organization	KETRACO
5	Counties Covered	KAJIADO, KIAMBU, NAROK AND NAIROBI
6	Project Purpose	The project will enhance system stability by providing alternative

		substations to supply Nairobi as well as reduce the cost power through reduction of transmission losses. The project also aims at evacuating power from Olkaria to Nairobi and facilitating international power trade between Kenya, Tanzania and Ethiopia. Improved reliable electricity will support the vision 2030 and the Big 4 Agenda initiative.				
7	Brief Description of Project	The project consists of 100km, 400kV double circuit (to be originally operated at 220kV) transmission line from Suswa to Isinya with 220/66kV Isinya, Athi River, Kimuka (Ngong) and KomaRock substations and the extension of the 220/132kV Lessos substation. The line portion of the project was completed in 2017. Initial Contract for the substations was terminated and a new awarded to a new Contractor. The following are the project's major risk and possible mitigation measure: The reduction in AFD funding, National Treasury needs to create CBK account where project related funds from AFD could be channeled to not as current status where the funds are channeled directly to Ketraco. This needs to be done by 31.10.2018. Ketraco is closely following up with Ministry of Energy, National Treasury and the Financier (AFD).				
8	Project Status	Line Complete, Substations Ongoing (SS Lot A = (Isinya & Athi River), SS Lot B = (Malaa & Kimuka) Site Works (civil) began at Malaa in September. Overall works in Malaa still less than 1 %)				
9	Estimated Project Duration	Twenty (20) months				
10	Estimated Project Cost (Total Project Cost Kshs. 24,837 Million)	FY.2017/18	FY.2018/19	FY.2019/20	FY.2020/21	FY.2021/22
		Kshs "Million"				
		2,403	3,107	4,751	4,800	-
11	Economic and Social Benefits	Reduced cost and increased quality of power, job creation, enhancing ICT through the fibre network on the transmission lines.				
12	Sources of Financing	French Development Agency (AFD), European Investment Bank (EIB) and Government of Kenya				

21. OLKARIA LESSOS KISUMU

1	Project Name	OLKARIA LESSOS KISUMU TRANSMISSION LINES CONSTRUCTION LINE PROJECT
2	Project Geographic Location	RIFT VALLEY, NYANZA
3	Project Type	MEGAPROJECT
4	Implementing Organization	KETRACO
5	Counties Covered	NAKURU, KISUMU, NANDI, BARINGO, UASIN GISHU
6	Project Purpose	The objective of the Project is to facilitate the strong trunk line of electrical power between the eastern and western parts of the national transmission grid. The extension and new construction of the related substations, which are necessary for the connection of the new transmission lines, are also the important outcomes of the Project.
7	Brief Description of Project	The project will involve the construction of 213km 400 kV double circuit from Olkaria to Lessos, 73.5km 220 kV double circuit line from Lessos to Kisumu and 3.5km 132 kV double circuit line Kisumu East (Kibos) substation to Kisumu (Mamboleo) substation, new 220/132/33 kV 150 MVA Kisumu East (Kibos) substation, extension of 132/33 kV Mamboleo Substation, Extension of 220/132/33 kV Lessos substation and extension of 220/132 KV Olkaria II substation. The following are the projects major risks and possible mitigation measures. • Delay in project implementation and cost overruns on the transmission line component of the project due to acquisition of right of way. KETRACO is engaged in negotiations with the stakeholders (community, political leaders, MOE&P, County Government) as the way leave officers recruited try to solve way leave issues as they arise on the ground
8	Project Status	Ongoing Line 60%, substations 85%
9	Estimated Project	24 months

	Duration					
10	Estimated Project Cost (Total Project Cost Kshs. 18,200 Million)	FY.2017/18	FY.2018/19	FY.2019/20	FY.2020/21	FY.2021/22
		Kshs "Million"				
		3,446	2,242	5,501	1,400	-
11	Economic and Social Benefits	Increased power reliability, regional interconnection and power trade, reduced energy cost and increased quality of power, job creation, enhancing ICT through the fibre network on the transmission lines.				
12	Sources of Financing	JICA, GOK				

22. National System Control Centre

1	Project Name	National System Control Centre (NSCC) Project
2	Project Geographic Location	Nairobi
3	Project Type	MEGAPROJECT
4	Implementing Organization	KETRACO
5	Counties Covered	47
6	Project Purpose	As the national power system expands (generation and transmission), the existing National Control Centre (NCC) will not adequately cope with power system control and load dispatch demands/requirements, especially with the projected enhanced renewable resources (intermittent wind and solar PV), regional interconnections and greater accountability expectation from customers in the Kenya Constitution 2010. A new, modern state of the art NSCC, incorporating smart grid principles with wider system monitoring capability, planning, training, control and load dispatch functionalities, will be critical to meet the impending challenge of the bigger national grid within the Eastern Africa Power Pool (EAPP).
7	Brief Description of Project	Upon completion and commissioning, the NSCC will provide (i) more accurate load demand projection/forecast (planning), (ii) more coordinated, effective, efficient and economic generation dispatch/scheduling and unit commitment (iii) more accurate and

		faster operational decisions (iv) shorter supply interruption periods (v) more efficient coordination of regional transmission interconnectors and energy wheeling (vi) effective power system operator training. The modern NSCC system will incorporate such functionalities as Automatic Generation Control, Power System Simulation, Fault Incidence Replay and Analysis, Load Forecast and Economic Load Dispatch, Unit Commitment, Import/Export Scheduling, among others. Project Risk: (i) Timely financial mobilization – Mitigation: (a) the company signed MoU with NARI Group of China (b) AfD has expressed interest in writing to finance the project (letter sent to National Treasury by MoEP. The Back Up NSCC will serve as back up to the Main NSCC as is the best practice worldwide to guarantee near 100% availability of the functionality of an NSCC in the Power System Operations.				
8	Project Status	Technical specifications review and tender documents preparations. Finalizing on Financing arrangements				
9	Estimated Project Duration	29 Months				
10	Estimated Project Cost (Total Project Cost Kshs. 6,190 Million)	FY.2017/18	FY.2018/19	FY.2019/20	FY.2020/21	FY.2021/22
		Kshs "Million"				
		-	-	3,898	2,292	-
11	Economic and Social Benefits	High availability of the National Grid, Efficient and Coordinated Power System Operations (Economic Generation Dispatch, Regional Interconnection Management, Contingency Expectation, etc.), Faster Fault Location, Diagnosis and Isolation, Reduced Supply Outage Time, Improved System Operational Decisions, Reduced O & M Costs (minimum field operator and sub-station manning crews).				
12	Sources of Financing	AFD,GOK				

23. KENYA POWER & LIGHTING COMPANY LIMITED

1. Prepaid Solar Charging Systems and Rechargeable Lanterns/Lodwar Solar station

1	Project name	Supply, installation & commissioning of pre-paid solar lanterns in arid and semi-arid areas and Lodwar 550 KW Solar Station.			
2	Project geographic location:	Homabay, Garissa, Mandera, Homa, Turkana, Marsabit, Isiolo, Samburu, Tana River, Wajir, Baringo, Meru and Embu.			
3	Project Type/ Category	Small Project			
4	Implementing organization (s)	KPLC			
5	Counties covered	Homabay, Garissa, Mandera, Homa, Turkana, Marsabit, Isiolo, Samburu, Tana River, Wajir, Baringo, Meru and Embu			
6	Project Purpose	To enable communities that are not connected to grid electricity access clean solar energy for lighting and use in mobile phone charging and avoid use of Kerosene.			
7	Brief description of the project (Project summary)	The project is aimed at having sustainable way to conserve environment and enable communities to have light that can be used for reading and for communication through mobile phones. The lamps and mobile phones are charged at the premises of an agent in which they pay a fee that will be used for maintenance and some small profit to the agent. The money collected is remitted to be used to benefit other communities through roll-out to new areas. Where an agent has failed to remit the money, the charging system is disabled from a central point until payment token is purchased through mobile money or pay bill system. It also ensure reliable and stable power in the Turkana and its environs			
8	Project stage	On going • The prepaid solar charging system project is fully implemented • The procurement of the lodwar solar power station is on-going but has been delayed by a litigation.			
9	Estimated project duration	48 months			
	Estimated project cost: Kes.'M': 440	Cumulative Expenditure as 30.06.18	FY2018/19	FY2019/20	FY2020/21
		Kshs. Million			
		272	168	0	0
	Economic	1. Income from agency of the pre-paid system 2. Better quality of life from use of clean energy 3. Improvement in academic standard due to more study time 4. Respiratory disease from use of kerosene and wood fuel will be avoided. 5. Stable and reliable power 6. Low cost of electricity.			
		Grant from NDF			

2. SCALING UP ENERGY ACCESS PROJECT

1	Project name	SCALING UP ENERGY ACCESS PROJECT
2	Project geographic location:	NATIONWIDE
3	Project Type/ Category	MEGA PROJECT
4	Implementing organization (s)	THE KENYA POWER & LIGHTING COMPANY LTD
5	Counties covered	ALL COUNTIES
6	Project Purpose	The purpose of the project is to achieve efficiency and sustainable use of power in Kenyan homes. Many poor households in Kenya continue to use inefficient lighting systems, which are expensive in terms of energy costs to themselves and the country. Energy Efficiency in Kenya will deliver energy savings; reduced Green House gases & supports energy security in the country. Through densification will increase electricity access. Creation of a fund to enable potential customers to easily access affordable credit to finance connection costs makes electricity connection affordable. This project is in line with the Second Medium Term Plan of the Vision 2030 in ensuring adequate energy that is affordable to businesses and homes as a Foundation of the Economy and Society. - Reduced energy poverty and increased standards of living as the beneficiaries will make savings, hence making the money available for other products and improving their social economic status. - Reduction of Green House Gas Emissions to the tune of 120,000 tons/ year, mitigating climate change - An inexpensive program that supports energy security and reduces peak power demand, deferring the need for expensive generation capacity. - Increased access to electricity energy. - Affordable credit to finance electricity connection.

7	Brief description of the project (Project summary)	7. Brief description of the project (Project summary): ➤ The project involves distribution 3 million Compacted Fluorescent Lamps (Energy Saving Bulbs) in households in Kenya. ➤ Transformer densification-line maximization in rural areas to increase electricity access rate to the rural poor. ➤ Stima Loan-Provision of Revolving fund for customer connection. Benefits, - Reduced peak demand - Energy & energy cost savings - Reduced GHG emissions - Improved awareness on energy efficient lighting - Increase accessibility to rural areas - Easy access to cheap financing to the low income earners for power connection Some of the project risks and their mitigations are outlined below. i. Inadequate Processes not in place for Launch or not adhered to during Project operations <u>Mitigation Strategy</u> • Establish & develop Processes and detailed Procedures required for successful implementation before Launch & based on KPLC Distribution Plan guidelines. • Ensure all Stakeholders are aware and committed to follow processes. • Monitor, review & support on-going adherence to Processes by all involved. • Provide adequate training on need for processes and importance of being diligent. Automation of the Stima Loan process. ii. Field Teams do not follow Install procedures and jeopardize project <u>Mitigation Strategy</u> • Ensure obligations are clear in Contracts & adequate training takes place for all staff. • Constant fault monitoring undertaken to ensure rapid remediation takes place. • Spot check audits of Install process undertaken with clear escalation procedures.
8	Project stage	On-going. • The component for distribution 3 million Compacted Fluorescent Lamps (Energy Saving Bulbs) is completed and destruction of the replaced incandescent bulbs is on-going. • Densification component is currently under implementation with design and supply of materials is fully done. Installation work is ongoing and currently at 20%.

		Stima Loan Revolving fund has been established and functional.				
9	Estimated project duration	60 Months				
10	Estimated project cost: Kes.'M': 440	FY	Accumulated Expenditure as at 30.06.18	FY2018/2019	FY2019/2020	FY2020/2021
		Kshs. Million				
			2450	2200	0	0
11	Outline economic and social benefits:	11. Economic and social benefits - Free capital for other projects - Reduced foreign energy costs - Lower business cost - Reduced pollution - Lower energy bills				
12	Outline sources of financing	12. Sources of financing: Agence Française de Développement (AFD)				

3. Nairobi 132 kV and 66 Kv network Upgrade and Reinforcement.

1	Project name	NAIROBI 132 kV and 66 Kv network upgrade and reinforcement
2	Project geographic location:	Central Business District, Nairobi and Kiambu
3	Project Type/ Category	Mega Projects
4	Implementing organization (s)	Kenya Power & Lighting Co. Ltd
5	Counties covered	Nairobi, Kiambu
6	Project Purpose	To reduce grid breakdowns and increase supply capacity for Nairobi City and its environs.
7	Brief description of the project (Project summary)	Project summary - Extension of the Embakasi substation 220kV bus bars and establishment of two (2) new- 220kV line bays AIS with cable take- offs. - Establishment of a new City Centre 220/66kV, 2X200MVA GIS substation and its associated transmission lines (approximately 16.5km). - Construct 2x45MVA Likoni rd, AIS substation, 2x23MVA, AIS Kiu River

		substation - Construct substation extension bays for Parklands, Muthurwa, Nairobi West and associated lines (approx 30.71km) - Modernize Cathedral substation by replacing the 66kV AIS with 66kV GIS switchgear			
8	Project stage	On going The project is complete and contractor is clearing snags and retention payment			
9	Estimated project duration	48 months			
10	Estimated project cost: Kes.'M': 13,200	Cumulative Expenditure as 30.06.18	FY2018/19	FY2019/20	FY2020/21
		Kshs. Million			
		8,567	2,133	2,500	0.00
11	Outline economic and social benefits:	- Financial benefit for KPLC due to reduced breakdowns & maintenance costs and added power supply capacity. - The improved supply quality will spur economic growth as customers will enjoy fewer supply interruptions. - Reduction in supply interruptions will positively impact on the social welfare and economic growth.			
12	Outline sources of financing	Exim Bank, China.			

4. Last Mile Connectivity Project.

1	Project name	Last Mile Connectivity Project
2	Project geographic location:	Nationwide
3	Project Type/ Category	Mega Projects
4	Implementing organization (s)	Kenya Power & Lighting Company Limited
5	Counties covered	47 Counties
6	Project Purpose	The objective of the project is to accelerate connectivity and network expansion by adopting a new electricity supply model that will assist in overcoming existing bottlenecks in the connectivity pipeline. The current trend of network expansion is customer driven .The new model will focus on availing service connection to the customer before engaging him / her to pay for the services. This model will reduce the cost burden of increased

		connectivity on KPLC as well as reduce the amount paid by the customer to connect to the grid through extension of low voltage network on existing and other upcoming distribution transformers to reach households lying within transformer protection distance. It is envisaged that this will result in accelerated economic growth at the micro-economic level in line with the Government's vision 2030.				
7	Brief description of the project (Project summary)	The Last Mile Connectivity Project aims to support the Government's initiatives of ensuring increased electricity access to Kenyans by extending the low voltage network on existing and other upcoming distribution transformers to reach households lying within transformer protection distance in all the 47 counties across the country. The existing distribution transformers shall be utilized to the maximum through extension of low voltage network which entails construction of low voltage distribution lines, installation of equipment for the connection of residential customers and commercial customers. The project is implemented in phases depending on availability of financing. Some of the risks anticipated in the project include failure by the contractors to deliver on time due to the wide geographical spread of the project. Enhanced supervision shall be put in place to ensure that the contractors deliver on time. Refusal by some people to grant way leaves will be addressed through education and sensitization programs to ensure acceptance and ownership of the project by the communities. Education programmes shall also be carried out to reduce occupational safety and health hazards which may occur during construction.				
8	Project stage	On-Going. • The project is being implemented in phases. • Phase I is 70 % complete. • Phase II has just commenced with mobilization advance paid. Most contractors have begun designs and procurement of materials. • Phase III is under tendering. The consultancy contract has been signed and mobilization advance under process. •				
9	Estimated project duration	Estimated Project Duration: 60 Months				
10	Estimated project Kshs. Million. 57,600.0 cost:	Cumulative Expenditure as at June 2018	FY2018/19	FY2019/20	FY2020/21	FY2021/22
		Kshs. Million				
		20,135	6,690	16,500	16,275	16,275
11	Outline economic and social benefits:	Economic and Social Benefits: ➤ The Last Mile Connectivity Project is expected to spur growth of businesses, this will create demand for other goods and services hence				

		promoting accelerated growth in the economy. ➤ Creation of small businesses will accelerate job creation leading to improved economic well-being of Kenyans. Building of service lines will also create a considerable number of jobs. ➤ Access to electricity at the household level and schools will lead to betterment of education services, children will have an opportunity to extend their study time and laboratories in schools will be well equipped and use of ICT will be promoted. ➤ There will be reduction of pollution associated with use of thermal power, keroses and wood fuel. ➤ A reduction in reliance to wood fuel will lead to reduced destruction of forests. ➤ Improved standards of living will be realized as customers will now be able to use electricity appliances. ➤ Security will be enhanced arising from well-lit social, commercial and individual premises. ➤ Improved communication amongst communities and connectivity to global facilities through internet and mobile technology.
12	Outline sources of financing	Sources of Financing: AfDB/EIB/EU/AFD

5. Kenya Electricity Modernization Project (Kemp)– Electrification Component

1	Project name	Electrification Program
2	Project geographic location:	Nationwide
3	Project Type/ Category	Mega Projects
4	Implementing organization (s)	Kenya Power & Lighting Company Limited
5	Counties covered	Peri-Urban areas spread across the country
6	Project Purpose	• The objective of the project is to accelerate connectivity and network expansion by adopting a new electricity supply model that will assist in overcoming existing bottlenecks in the connectivity pipeline. • The current trend of network expansion is customer driven .The new model will focus on availing service connection to the customer before engaging him / her to pay for the services. • This model will reduce the cost burden of increased connectivity on KPLC

		as well as reduce the amount paid by the customer to connect to the grid through extension of low voltage network on existing and other upcoming distribution transformers, establishing of new distribution transformers and associated low voltage reticulation to reach households lying within transformer protection distance. • It is envisaged that this will result in accelerated economic growth at the micro-economic level in line with the Government's vision 2030.
7	Brief description of the project (Project summary)	The project comprises of four components; • Electrification program-Last mile connectivity The Project aims to support the Governments initiatives of ensuring increased electricity access to Kenyans by extending the low voltage network on existing and other upcoming distribution transformers to reach households lying within transformer protection distance in all the 47 counties across the country. The existing distribution transformers shall be utilized to the maximum through extension of low voltage network which entails construction of 1000km of medium voltage line, establishing of approximately 1000 distribution transformers, construction of 25,000kilometers of low voltage distribution lines, and connection of 312,500 customers. • Advanced Distribution Management System It involves design,supply,installation,testing and commissioning of a feeder scada system ,outage management system ,distribution management system, workforce management system, communication system and automating of 100 ring main units,880 load break switches and 80 Auto reclosures. • Advance Metering Infrastructure Includes creation of metering control centres , investment IT infrastructure to operate them ,acquiring meter data management software and supply & installation of 77,000 smart meters. • Scada Upgrade of KPLC scada /EMS by incorporating key existing substations into the system. • Live Line Maintenance Initiative The Project involved the putting up the necessary infrastructure that can facilitate live line maintenance. These comprises of Procurement of Insulated Platforms which can be used as access to the overhead lines, Establishment of Testing Facility and Procurement specialized Tools and Accessories. Some of the risks anticipated in the project include; • Failure by the contractors to deliver on time due to the wide geographical spread of the project. Enhanced supervision shall be put in place to ensure that the contractors deliver on time. • Refusal by some people to grant way leaves will be addressed through

		education and sensitization programs to ensure acceptance and ownership of the project by the communities. Education programmes shall also be carried out to reduce occupational safety and health hazards which may occur during construction.				
8	Project stage	On-going. • Electrification program Design work is complete. Supply of materials and Installation is ongoing. • Advanced Distribution Management System. The contractor is mobilizing and advance payment is in progress. • Advance Metering Infrastructure The project is under procurement. • Scada Design work is complete. Supply of materials and Installation is ongoing. • Live Line Maintenance Initiative Construction of laboratory ,assembling of the specialized trucks and Training of personnel is on going.				
9	Estimated project duration	36 Months				
10	Estimated Project cost Kes.' M²- 24,800	Cumulative Expenditure as 30.06.18	FY2018/19	FY2019/20	FY2020/21	FY2021/22
		Kshs. Million				
		3,841	880	8,958	11,121	0
11	Outline economic and social benefits:	Outline Economic and Social Benefits: ➤ The Last Mile Connectivity Project is expected to spur growth of businesses; this will create demand for other goods and services hence promoting accelerated growth in the economy. ➤ Creation of small businesses will accelerate job creation leading to improved economic well-being of Kenyans. ➤ Building of service lines will also create a considerable number of jobs. ➤ Access to electricity at the household level and schools will lead to betterment of education services, children will have an opportunity to extend their study time and laboratories in schools will be well equipped and use of ICT will be promoted. ➤ There will be reduction of pollution associated with use of thermal power, kerosene and wood fuel. ➤ A reduction in reliance to wood fuel will lead to reduced destruction of forests. ➤ Improved standards of living will be realized as customers will now be able to use electricity appliances. ➤ Security will be enhanced arising from well-lit social, commercial and				

		individual premises. ➤ Improved communication amongst communities and connectivity to global facilities through internet and mobile technology.
12	Outline sources of financing	Outline Sources of Financing: World Bank

6. Nairobi City Centre E.H.V and 66 Kv Network Upgrade and Reinforcement

1	Project name	Nairobi City Centre E.H.V and 66 Kv Network Upgrade and Reinforcement			
2	Project geographic location:	Central Business District, Nairobi and Kiambu			
3	Project Type/ Category	Mega Projects			
4	Implementing organization (s)	Kenya Power & Lighting Co. Ltd			
5	Counties covered	Nairobi, Kiambu			
6	Project Purpose	- To reduce grid breakdowns and increase supply capacity for Nairobi City and its environs.			
7	Brief description of the project (Project summary)	- Establishment of new substations and construction of the necessary MV,HV Lines - Undergrounding of the OT lines in the Nairobi CBD and suburbs.			
8	Project stage	New Project. Procurement process is on-going.			
9	Estimated project duration	24 Months			
10	Estimated	Cumulative	FY2018/19	FY2019/20	FY2020/21

	project cost: Kes,'M': 10,500.00	Expenditure as 30.06.18			
		Kshs. Million			
		0	430	5,300	4,770
11	Outline economic and social benefits:	- Financial benefit for KPLC due to reduced breakdowns & maintenance costs and added power supply capacity. - The improved supply quality will spur economic growth as customers will enjoy fewer supply interruptions. - Reduction in supply interruptions will positively impact on the social welfare and economic growth.			
12	Outline sources of financing	Exim Bank, China.			

7. Retrofitting of Minigrids

1	Project name	Retroffing of Minigrids				
2	Project geographic location:	Off-grid sites				
3	Project Type/ Category	Mega Project				
4	Implementing organization (s)	KPLC/MOE/REA				
5	Counties covered	Turkana,Marsabit,Wajir,Mandera,Homabay,Lamu,samburu				
6	Project Purpose	➤ Maximize use of renewables in order to lower fuel costs and also to lower carbon emissions.				
7	Brief description of the project (Project summary)	The project is aimed at; ➤ To transition existing sites to hybrid systems that maximize use of renewables in order to lower fuel costs and also to lower carbon emissions.				
8	Project stage	New project. - Consultancy contract signed and Advance payment under process. - The Works contracts are under procurement.				
9	Estimated project duration	42 Months – End date: 30/06/2022				
10	Estimated project cost: Kes Million: 3,080	FY	Cumulative Expenditure as 30.06.18	FY2018/19	FY2019/20	FY2020/21
				9	0	1
						2

		Kshs. Million					
			0	500	1,200	1,000	380
11	Outline economic and social benefits:	a) To provide infrastructure necessary to support Kenya’s Vision 2030 for economic and social development. b) Contribute to expanding electricity infrastructure that is constraining growth. c) Electrification component will help to improve the quality of life particularly in poor areas of the Country d) Clean Energy for development through;- i. Meeting energy needs of developing country and widening access to energy services for the citizens in an environmentally sustainable way; ii. Reducing greenhouse gas emissions and transition to a low – carbon economy; and iii. Helping country adopt to climate change risks					
12	Outline sources of financing	AFD					

8. Primary Substations in Rural Areas (to support Last Mile Connectivity Project)

1	Project name	Primary Substations in Rural Areas to support Last mile connectivity Project.
2	Project geographic location:	10 counties to be selected across the country
3	Project Type/ Category	Mega Project
4	Implementing organization (s)	KPLC
5	Counties covered	10 Counties
6	Project Purpose	➤ Increase the capacity, efficiency and quality of electricity supply for the connected last mile customers. ➤ Expand access to electricity in peri-urban and rural areas where last-mile customers are being implemented. ➤ Network expansion and reliability. ➤ The proposed substations will provide capacity enhancement to cater for growth as well as improve reliability and flexibility in rural areas and shorten the lengths of existing 11kV lines from the existing 33/11kV substations.

7	Brief description of the project (Project summary)	The project is aimed at; ➤ Construction of about 10 New Primary Substations ➤ The reinforcement and extension of the distribution network resulting in more new connections in rural areas due to the Last Mile connectivity Project					
8	Project stage	New project. The project is under procurement.					
9	Estimated project duration	48Months end date June 2022					
10	Estimated project cost :Kes Million: 4,000.00	FY	FY2017/18	FY2018/19	FY2019/2020	FY2020/21	FY2021/22
		Kshs. Millions					
			Nil	1,000	1,000	1,000	1,000
11	Outline economic and social benefits:	a. To provide infrastructure necessary to support Kenya's Vision 2030 for economic and social development. b. Contribute to expanding electricity infrastructure that is constraining growth. c. Electrification component will help to improve the quality of life particularly in poor areas of the Country d. Clean Energy for development through;- e. Meeting energy needs of developing country and widening access to energy services for the citizens in an environmentally sustainable way; f. Reducing greenhouse gas emissions and transition to a low –carbon economy; and g. Helping country adopt to climate change risks					
12	Outline sources of financing	GoK					

E. RURAL ELECTRIFICATION AUTHORITY

1. ELECTRIFICATION OF HEALTH CENTRES, TRADING CENTRES AND SECONDARY SCHOOLS

1	Project Name	Electrification of Public Facilities				
2	Project Geographic Location	National wide				
3	Project Type / Category	Mega Project				
4	Implementing Organization	REA				
5	Counties Covered	47				
6	Project Purpose	Electrification of the Public Facilities including Health Centres , Trading Centres and Secondary Schools				
7	Project Description	Project aims at having the remaining health centres, trading centres and secondary schools electrified to spur economic activities				
		Probable risks include vandalism of installed infrastructure and wayleave issues				
		Proposed steps to ensure sustainability include stakeholder involvement				
8	Project Stage	Ongoing Project				
9	Estimated Project Duration	48 Months				
10	Estimated Project Cost 65,257					
		FY2017/18	FY2018/19	FY2019/20	FY2020/21	FY2021/22
		Kshs. Million				
		2,440	5,269	12,921	12,921	12,921
11	Economic and Social Benefits	Provision of electricity for socio-economic improvement and extended economic hours for the areas				
12	Sources of Financing	GoK				

2. KENYA ELECTRICITY MODERNIZATION PROJECT - IDA

1	Project Name	Kenya Electricity Modernization Project - IDA
2	Project Geographic Location	Siaya, Homa bay; Kwale; Tana River and Kilifi Counties
3	Project Type / Category	Mega Project

4	Implementing Organization	REA				
5	Counties Covered	Siaya, Homa bay; Kwale; Tana River and Kilifi				
6	Project Purpose	To connect more Kenyan households to electricity supply and improve quality of electricity supply for accelerated development of the country.				
7	Project Description	Implementation of mini-grids supplied by hybrid generation systems, combining renewable resources (solar or wind) and thermal units running on diesel.				
		Probable risks include vandalism of installed infrastructure				
		Proposed steps to ensure sustainability include stakeholder involvement.				
8	Project Stage	Ongoing Project				
9	Estimated Project Duration	24 Months				
10	Estimated Project Cost Kshs. Million 1,100					
		FY2017/18	FY2018/19	FY2019/20	FY2020/21	FY2021/22
		Kshs. Million				
		50	621	350	-	-
11	Economic and Social Benefits	Provision of electricity for improvement of socio-economic status of local communities				
12	Sources of Financing	World Bank (IDA)				

3. INSTALLATION OF CONSTITUECY TRANSFORMERS

1	Project Name	Installation of Transformers
2	Project Geographic Location	National wide
3	Project Type / Category	Medium Project
4	Implementing Organization	REA
5	Counties Covered	47
6	Project Purpose	Installation of Extension Transformers to improve connectivity towards universal electrification
7	Project Description	Project aims at Installation of extra (Extension) Transformers in areas already served by High Voltage lines to improve connectivity towards universal electrification and to spur economic activities
		Probable risks include vandalism of installed infrastructure and wayleave issues

		Proposed steps to ensure sustainability include stakeholder involvement				
8	Project Stage	Ongoing Project				
9	Estimated Project Duration	36 Months				
10	Estimated Project Cost. Kshs. Million 15,000					
		FY2017/18	FY2018/19	FY2019/20	FY2020/21	FY2021/22
		Kshs. Million				
		2,625	1,500	3,000	3,000	775
11	Economic and Social Benefits	Provision of electricity for socio-economic development				
12	Sources of Financing	GoK				

4. TURKWEL - LOKICHAR 66kV LINE

1	Project Name	Turkwel - Lokichar 66kV Line				
2	Project Geographic Location	Turkana County				
3	Project Type / Category	Mega Project				
4	Implementing Organization	REA				
5	Counties Covered	Turkana				
6	Project Purpose	Providing electricity to the oil producing areas				
7	Project Description	Construction of 66/33kV substation at Kalimungorok, 23MVA 66/33kV substation in Lokichar and grid extension of 120km of 66kV line from Turkwel to Lokichar.				
		Probable risks include community hostility and vandalism of installed infrastructure.				
		Proposed steps to ensure sustainability include stakeholder involvement				
8	Project Stage	Ongoing Project				
9	Estimated Project Duration	24 Months				
10	Estimated Project Cost Kshs. Million					
		FY2017/18	FY2018/19	FY2019/20	FY2020/21	FY2021/22

	1,652	Kshs. Million				
		-	300	-	-	-
11	Economic and Social Benefits	Improvement of socio-economic status of local communities and provision of electricity to oil drilling and prospecting companies.				
12	Sources of Financing	GoK				

5. KENYA OFF-GRID SOLAR ACCESS PROJECT

1	Project Name	Kenya Off-Grid Solar Access Project				
2	Project Geographic Location	Off -grid Counties				
3	Project Type / Category	Medium Project				
4	Implementing Organization	REA				
5	Counties Covered	Wajir, Mandera, Marsabit, Turkana, Samburu, Garissa, Isiolo, Lamu, T/ River, Kajiado, Narok, H/ Bay, T/Taveta, W/Pokot				
6	Project Purpose	Enhancing Provision of Electricity through Renewable Energy				
7	Project Description	Install 56 mini-grid systems to supply electricity to 400 towns in the respective counties (Wajir, Mandera, Marsabit, Turkana, Samburu, Garissa, Isiolo, Lamu, T/ River, Kajiado, Narok, H/ Bay, T/Taveta, W/Pokot)				
		Probable risks include area insecurity, vandalism of installed infrastructure and extended project duration due to lengthy negotiations with County Governments				
		Proposed steps to ensure sustainability include stakeholder involvement				
8	Project Stage	Ongoing Project				
9	Estimated Project Duration	48 Months				
10	Estimated Project Cost Kshs. Million 3,500					
		FY2017/18	FY2018/19	FY2019/20	FY2020/21	FY2021/22
		Kshs. Million				
		-	-	3,000	500	-
11	Economic and Social Benefits	Improvement of socio-economic status of local communities				
12	Sources of Financing	GoK / IDA				

6. GARISSA 50MW SOLAR PROJECT

1	Project Name	Garissa 50MW Solar Project				
2	Project Geographic Location	Garissa				
3	Project Type / Category	Mega Project				
4	Implementing Organization	REA				
5	Counties Covered	Garissa				
6	Project Purpose	Enhancing Renewable Energy and generate to grid				
7	Project Description	Setting up a 50MW solar mini-grid to feed into the national grid under the 500MW plan				
		Probable risks include extended project duration due to community hostility and vandalism of installed infrastructure.				
		Proposed steps to ensure sustainability include stakeholder involvement				
8	Project Stage	Ongoing Project (95% complete)				
9	Estimated Project Duration	24 Months				
10	Estimated Project Cost Kshs. Million 13,578					
		FY2017/18	FY2018/19	FY2019/20	FY2020/21	FY2021/22
		Kshs. Million				
		8,400	500	384	-	-
11	Economic and Social Benefits	Injection of cheaper power into the grid to reduce cost of power to users				
12	Sources of Financing	China Exim Bank				

7. ELECTRIFICATION OF WATER PROJECTS

1	Project Name	Electrification of Water Facilities
2	Project Geographic Location	National Wide
3	Project Type / Category	Mega Project
4	Implementing Organization	REA

5	Counties Covered	All 47				
6	Project Purpose	Enhancing Water Supply in the Country				
	Project Description	Electrify 2,000 Water Projects spread across the country				
		Probable risks include vandalism of installed infrastructure and wayleave issues				
		Proposed steps to ensure sustainability include stakeholder involvement and sensitization				
8	Project Stage	New Project				
9	Estimated Project Duration	24 Months				
10	Estimated Project Cost	(Kshs) 4,000,000,000				
		FY2017/18	FY2018/19	FY2019/20	FY2020/21	FY2021/22
		Kshs. Million				
		-	-	2,000	2,000	-
11	Economic and Social Benefits	Improvement of socio-economic status of local communities through access to clean water				
12	Sources of Financing	GoK				

F. MINISTRY OF ENERGY HEADQUARTER

1. ALTERNATIVE ENERGY TECHNOLOGIES

i. Hydro dams Water Catchment Re-afforestation.

1	Project name	Hydro dams Water catchment re-afforestation.				
2	Project geographic location	Upper Tana River & Sondu Miriu River Catchment, and Enoosupukia Water Tower.				
3	Project type/ Category	Ongoing.				
4	Implementing organization (s):	Ministry of Energy				
5	Counties covered	Meru, Nakuru, Bomet, Kisumu, Narok & Embu.				
6	Project purpose	Restoration and protection of water catchments for hydropower dams				
7	Brief description of the project (project summary):	- The project is geared towards protection of the hydrodam catchments and entails reforestation of the water towers in collaboration with KFS and CFAs of respectful catchments through planting tree seedlings and maintaining them with the local communities. - Creating awareness on energy efficiency and conservation in respect to wood fuels - Promoting establishment of woodlots by the communities for own used and revenue generation - Promoting renewable and clean energy solutions for cooking and lighting, such as solar solutions, that can substitute kerosene lamps and stoves and clean cookstoves to replace the tier one solutions.				
8	Project status	Ongoing.				
9	Estimated project duration (months):	96 months				
10	Estimated project cost	FY.2017/18	FY.2018/19	FY.2019/20	FY.2020/21	FY.2021/22
		Kshs. Million				
		80	80	80	80	80
11	Economic and social benefit	Restoration and protection of water towers' catchment for hydro dams, health improvement and prevention of biomass combustion respiratory diseases. Increased forest cover, Mitigation against climate change and additional revenue for communities from farm woodlots				
12	Sources of financing	GoK (PDL).				

- ii. Solar PV installation on Institutions and or community boreholes in ASAL areas, and rehabilitation of previously installed systems.

1	Project name	Solar PV installation on Institutions and or community boreholes in ASAL areas, and rehabilitation of previously installed systems.				
2	Project geographic location	ASAL Areas.				
3	Project type/ Category	On-going				
4	Implementing organization (s):	Ministry of Energy				
5	Counties covered	ASAL Areas				
6	Project purpose	Enhance access to renewable energy by institutions and households far from the main grid.				
7	Brief description of the project (project summary):	The project promotes solar solutions in ASAL areas where there is no access to electricity because they are located far from the National Grid or Mini grids. It targets Public institutions such as schools, dispensaries/health centres as well as community facilities such community boreholes. It entails identification of suitable sites, design, installation and maintenance of solar PV systems in the ASAL areas. The project has the following sub projects 1. Installation of Solar PV lighting solutions for public institutions 2. Installation of Solar PV pumping systems in community boreholes 3. Installation of Solar water desalination systems				
8	Project status	Ongoing.				
9	Estimated project duration (months):	96 months				
10	Estimated project cost	FY.2017/18	FY.2018/19	FY.2019/20	FY.2020/21	FY.2021/22
		Kshs. Million				
		110	110	130	130	130
11	Economic and social benefit	Access to modern energy services and social services at public and community facilities. Electrification of public facilities.				
12	Sources of	GOK				

	financing	
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iii. Energy Efficiency Programme (Investment Grade Audits, General Audits)

1	Project name	Energy Efficiency Programme (Investment Grade Audits, General Audits)				
2	Project geographic location	Various Manufacturing Industries in Kenya.				
3	Project type/Category:	On going				
4	Implementing organization (s):	Centre for Energy Efficiency - Kenya Association of Manufacturers.				
5	Counties covered	Major Industrial Cities.				
6	Project purpose	To promote energy efficiency and conservation in industries by conducting investment grade energy efficiency audits in selected industries across the country and thereby identify energy-saving opportunities.				
7	Brief description of the project (project summary):	The entails conducting investment grade energy audits in energy-consuming industries and institutions with the view to identify energy saving opportunities, recommend remedial measures and build capacity for efficient energy. The project also undertakes annual energy awards for industries or institutions that excel in implementing measures to improve energy use efficiency and thereby reducing the industry's or institution's carbon footprint.				
8	Project status	Ongoing.				
9	Estimated project duration (months):	72 Months				
10	Estimated project cost: Ksh. Million	FY.2017/18	FY.2018/19	FY.2019/20	FY.2020/21	FY.2021/22
		Kshs. Million				
		35	35	35	35	35
11	Economic and social benefit	Energy savings, reduced cost of manufacture, lower energy costs and reduced greenhouse gas emission.				
12	Sources of financing	GOK				

iv. Installation of wind masts & data loggers and rehabilitation of previously installed wind masts & data loggers

1	Project name	Installation of wind masts & data loggers and rehabilitation of
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		previously installed wind masts & data loggers.				
2	Project geographic location	Various places with proven wind potential				
3	Project type/Category:	On-going				
4	Implementing organization (s):	Ministry of Energy				
5	Counties covered	Various				
6	Project purpose	The purpose of the project is collect wind data from a potential site to enable for wind resource exploitation for power generation and/or other uses.				
7	Brief description of the project (project summary):	The project entails installation of data loggers mounted on wind masts at various heights (40 metres and 100 metres) above the ground level. This helps generate time-based wind data to indicate the energy-generation potential and thereby provide the requisite technical site wind characteristics to inform investment planning.				
8	Project status	Ongoing.				
9	Estimated project duration(months) :	96 Months				
10	Estimated project cost: Ksh. Million	FY.2017/18	FY.2018/19	FY.2019/20	FY.2020/21	FY.2021/22
		Kshs. million				
		45	45	45	45	45
11	Economic and social benefit	Accelerated investment in wind resource exploitation, increased access to clean energy, job creation and low carbon footprint of energy provision				
12	Sources of financing	GOK				

v. Construction of institutional biogas plants.

1	Project name	Construction of institutional biogas plants.
2	Project geographic location	Country wide
3	Project type/Category	On-going
4	Implementing organization (s):	Ministry of Energy
5	Counties covered	Country wide
6	Project purpose	To promote and increase penetration of renewable energy technologies.
7	Brief description of the project (project	The project aims at promoting use of animal and human waste in generation of biogas for cooking, fueling engines and or generation of electricity in institutions of learning. The project also aims at

	summary):	increasing the technical capacity of artisans in bio-digesters' constructions. The biogas systems thus constructed become demonstration and training units while replacing use of firewood or LPG. Use of clean cooking solutions is also incorporated in the project design. Slurry manure is an important by product the project. Expected results is increased adoption of biogas technology at institutional and domestic level more so with the youth.				
8	Project status	On going				
9	Estimated project duration (months):	96 Months				
10	Estimated project cost: Ksh. Million	FY.2017/18	FY.2018/19	FY.2019/20	FY.2020/21	FY.2021/22
		Kshs. Million				
		25	50	35	35	35
11	Economic and social benefit	Reduced expenditure on energy Cleaner environment, reduced emission of Methane gas from livestock				
12	Sources of financing	GOK				

vi. Pilot programme on Domestic household biogas digesters (upscaling biogas technology at household levels.)

1	Project name	Pilot programme on Domestic household biogas digesters (upscaling biogas technology at household levels.)
2	Project geographic location	Countrywide
3	Project type/ Category	On-going
4	Implementing organization (s):	Ministry of Energy
5	Counties covered	Country wide
6	Project purpose	Increase penetration of renewable energy technologies.
7	Brief description of the project (project summary):	The project aims at promoting use of animal and human waste in generation of biogas for cooking at domestic level. Construction of Biogas demonstration units is supported by the project in selected sites at farm level to be used for demonstration, training and promotion of the biogas technology in areas where livestock are zero / semi zero grazed. The project also aims at increasing technical capacity of artisans in construction of biogas plants. The biogas generated is used for cooking replacing firewood. Use of clean cooking solutions is also incorporated in the project design. Slurry manure is an important by product the project. Expected results is increased adoption of biogas technology at domestic level.

8	Project status					
9	Estimated project duration (months):	84 Months				
10	Estimated project cost: Ksh. Million	FY.2017/18	FY.2018/19	FY.2019/20	FY.2020/21	FY.2021/22
		Kshs. Million				
		42	92	92	92	92
11	Economic and social benefit					
12	Sources of financing	GOK				

vii. Expansion of Energy Centres & Promotions of RETs in the Counties

1	Project name	Expansion of Energy Centres & Promotions of RETs in the Counties				
2	Project geographic location	Various Counties				
3	Project type/ Category	On-going				
4	Implementing organization (s):	Ministry of Energy				
5	Counties covered	Kakamega, Busia, Garissa, Nairobi, Kericho, Kisii, Kitui, Turkana, Marsabit, Migori, Nyandarua, Meru, Kilifi, Uasin Gishu and Wajir.				
6	Project purpose	Establishment of Energy Centres in all Counties and promotion of applicable renewable energy technologies in host Counties.				
7	Brief description of the project (project summary):	The project concerns the increase of Energy Centres coverage in the Counties and the continued promotion of renewable energy technologies to facilitate their accelerated adoption and use. It entails phased-construction of new Energy Centres in selected Counties, Identification of sites, design and construction of office buildings and operationalization on one hand, and the promotion of adoption of various renewable energy technologies for household, institutions and for productive uses				
8	Project status	On-going				
9	Estimated project duration(months) :	Continuous				
10	Estimated project cost: Ksh. Million	FY.2017/18	FY.2018/19	FY.2019/20	FY.2020/21	FY.2021/22
		Kshs. Million				

		155	155	170	170	170
1 1	Economic and social benefit	Access to Clean energy resources, woodfuel saving , reduced energy cost, reduced labour and time saving, Reduced burden one one gender mainly women				
1 2	Sources of financing	GOK				

viii. Biofuel value chain development.

1	Project name	Biofuel value chain development.				
2	Project geographic location	Countrywide				
3	Project type/ Category	On-going				
4	Implementing organization (s):	Ministry of Energy & Numerical Machinery Complex.				
5	Counties covered	Various				
6	Project purpose	To coordinate the development of national bioenergy strategy and the deployment of biofuels by addressing inherent barriers in the biofuels value chains.				
7	Brief description of the project (project summary):	The project entails the development of various components of the biofuel value chain including production, transformation and use of biofuels. The current phase involves design and fabrication of oil extraction equipment and field testing of the use of the oil extractors. Other components planned for development are the biofuels production surveys for site mapping and marketing and development of a national bioenergy strategy. Biofuels include bioethanol for cooking and lighting and bio-diesel as transport fuel				
8	Project status	On-going				
9	Estimated project duration (months):	96 Months				
10	Estimated project cost	FY.2017/18	FY.2018/19	FY.2019/20	FY.2020/21	FY.2021/22
		Kshs. Million				
		6	6	15	25	40
11	Economic and social benefit	Increased uptake of cleaner cooking fuels, increased access to clean energy				
12	Sources of financing	GOK				

ix. Development of Community Small Hydro Power projects.

1	Project name	Development of Community Small Hydro Power projects.				
2	Project geographic location	Sites with proven small hydro potential Countrywide				
3	Project type/ Category	On-going				
4	Implementing organization (s):	Ministry of Energy				
5	Counties covered	Various Counties				
6	Project purpose	Harness small hydro potential in order to increase power supply for local communities.				
7	Brief description of the project (project summary):	The project entails identification of sites, design and facilitate the construction of community small hydro power projects and development and updating of a national hydropower atlas.				
8	Project status	On-going				
9	Estimated project duration (months):	96 Months				
10	Estimated project cost (Ksh. Million)	FY.2017/18	FY.2018/19	FY.2019/20	FY.2020/21	FY.2021/22
		Kshs. Million				
		20	20	30	40	50
11	Economic and social benefit	Increased power supply				
12	Sources of financing	GOK				

x. Energy Efficient Charcoal Kilns Development.

1	Project name	Energy Efficient Charcoal Kilns Development.
2	Project geographic location	Countrywide
3	Project type/Category:	On-going
4	Implementing	Ministry of Energy

	organization (s):					
5	Counties covered	Various				
6	Project purpose	Increase penetration of energy efficiency and conservation technologies for charcoal production				
7	Brief description of the project (project summary):	The project entails the construction of efficient charcoal kilns at the Energy Centres and for the purpose of demonstration, training and awareness creation. It is underpinned on the realization that charcoal use by urban and rural households will inevitably continue particularly for on-farm woodfuel producers.				
8	Project status	On-going				
9	Estimated project duration(months):	84 Months				
10	Estimated project cost (Ksh. Million)	FY.2017/18	FY.2018/19	FY.2019/20	FY.2020/21	FY.2021/22
		Kshs. Million				
		7	5	10	15	15
11	Economic and social benefit	Improved efficiency of wood conversion to charcoal and thereby increase wood conservation.				
12	Sources of financing	GOK				

xi. Development of National Energy laboratory

No.	ITEM	Project Code: -
1	Project name	Development of National Energy laboratory
2	Project geographic location	Konza Techno City
3	Project type/ Category	Starting
4	Implementing organization (s):	Ministry of Energy
5	Counties covered	Lab will serve the entire Country
6	Project purpose	To accelerate Renewable energy development and deployment in Kenya
7	Brief description of the project (project summary):	The proposed project entails the establishment and operationalization of a Kenya National Renewable Energy Laboratory (KNREL). The laboratory is identified as a necessary vehicle to undertake the critical applied energy research roles in order to accelerate renewable energy development and deployment.

		The Laboratory will work closely with industry, government, academia, small businesses, international organizations and non-profit organizations to advance the use of clean energy technologies in the market place. In addition, the lab is envisaged to be operated as a technical branch of the Ministry of Energy and therefore within the frame of energy sector activities. It will be implemented in phases in accordance with a plan of action to be agreed upon between the participating partners and agencies.				
8	Project status	This is a new project. The project is at the formative stage. A steering committee has been formed to spearhead the project formulation. Discussions are on-going with potential financiers.				
9	Estimated project duration (months):	60 months				
10	Estimated project cost	FY.2017/18	FY.2018/19	FY.2019/20	FY.2020/21	FY.2021/22
		Kshs. Million				
		-	-	10	15	15
11	Economic and social benefit	Renewable energy generation increased, accelerated growth of RE-based SMEs and IPPs, Increased health benefits associated with reduced consumption of traditional biomass energy, Environmental benefits accruing from progressive reduction of polluting energy supplies, additional employment opportunities created, economic growth stimulated.				
12	Sources of financing	GOK and International Development Partners (Specific levels of contribution to be determined when project document is in place.				

xii. Lake Turkana Wind Power Project

No.	ITEM	Project Code: - 1152105301
1	Project name	Lake Turkana Wind Power Project
2	Project geographic location	Marsabit County
3	Project type/Category:	This is a Public-Private-Partnership project.
4	Implementing organization (s):	Lake Turkana Wind Power Limited, Ministry of Energy, Kenya Revenue Authority
5	Counties covered	Marsabit
6	Project purpose	To develop and generate 300 MW of wind power
7	Brief	The Lake Turkana Wind Power project is a Public-Private-Partnership

	description of the project (project summary):	project which involves the development and construction of a 300 MW wind farm. It is located in Loiyangalani sub-county, Marsabit County, Kenya. The wind farm comprises of 365 wind turbines, each with a capacity of 850kW, and a high voltage substation that will be connected to the Kenyan national grid through an associated Transmission Line, which is being constructed by the Kenyan Government. Through the PPP arrangement, the Government of Kenya undertook to pay all the project associated taxes.				
8	Project status	The installation of the 365 wind turbines is complete. The construction of the power transmission line is at the final stages.				
9	Estimated project duration (months):	78 months				
10	Estimated project cost in Ksh. Million	FY.2017/18	FY.2017/18	FY.2017/18	FY.2017/18	FY.2017/18
		Kshs. Million				
		7,019	-	500	430	0
11	Economic and social benefit	Increased power generation capacity, increased access to electricity.				
12	Sources of financing	Private sector in partnership with GOK (Public Private Partnership)				

xiii. Kenya Off-grid Solar Access Project (KOSAP)

No.	ITEM	Project Code: - 1152108001, 1152108201 ,1152108301
1	Project name	Kenya Off-grid Solar Access Project (KOSAP)
2	Project geographic location	14 underserved Counties in the ASAL
3	Project type/Category:	On-going
4	Implementing organization (s):	Ministry of Energy, REA and KPLC
5	Counties covered	14 ASAL Counties
6	Project purpose	The project is addressing the lack of access to modern energy, including electricity and improved cookstoves. Its purpose is to increase access to solar energy for households, develop mini-grids for water pumping to support irrigation and to promote adoption of

		improved efficiency cook stoves. The project contributes to the achievement of a broad based inclusive economic growth, job creation, reduction of poverty and inequality, take into account climate change impacts while meeting the Sustainable Development Goals(SDGs). At the same time, the project also contributes to the achievement of the Big Four development objectives.				
7	Brief description of the project (project summary):	The project entails implementation of four components: (i) Mini-grids for Community Facilities, Enterprises, and Households; (ii) Standalone Solar Systems, and Clean Cooking Solutions for Households; (iii) Standalone Solar Systems and (iv) Solar Water Pumps for Community Facilities and Implementation Support and Capacity Building. The total project funding is USD 150 million.				
8	Project status	On-going				
9	Estimated project duration (months):	60 months				
10	Estimated project cost in Ksh. Million	FY.2017/18	FY.2018/19	FY.2019/20	FY.2020/21	FY.2021/22
		Kshs. Million				
		372	680	6,107	4,789	2,017
11	Economic and social benefit	Access to modern energy by the underserved and unserved communities in the ASAL Counties.				
12	Sources of financing	IDA/World Bank				

xiv. Kenya Sustainable Energy for All Project

No.	ITEM	Project Code: - New
1	Project name	Kenya Sustainable Energy for All Project
2	Project geographic location	Country wide
3	Project type/Category:	On-going
4	Implementing organization (s):	Ministry of Energy, Counties
5	Counties covered	All
6	Project purpose	To build capacities for Counties for implementing Sustainable Energy for All (SEforAll) National Action Agenda towards meeting SDG 7 goals and also to effectively contribute to the achievement of the Big Four national Agenda.
7	Brief	The project entails the implementing the recommendations of the

	description of the project (project summary):	SEforALL National Action Agenda and Investment Prospectus at the County Government level. It will support the establishment of SEforALL coordinating units at the County level and operationalization of the County Energy Planning framework. This action agenda has been aligned to SDG 7 and the Vision 2030. This project is financed by European Union. The project is expected to start in February 2019.				
8	Project status	New				
9	Estimated project duration (months):	60 months				
10	Estimated project cost in Ksh. Million	FY.2017/18	FY.2018/19	FY.2019/20	FY.2020/21	FY.2021/22
		Kshs. Million				
		25	-	100	300	300
11	Economic and social benefit	Increased access to modern energy services, increased share of renewable energy in the overall national energy supply.				
12	Sources of financing	European Union and GOK				

xv. Renewable Energy policy reviewed & implementation oversight

No.	ITEM	Project Code: - New
1	Project name	Renewable Energy policy reviewed & implementation oversight
2	Project geographic location	Country wide
3	Project type/Category:	New
4	Implementing organization (s):	Ministry of Energy
5	Counties covered	All
6	Project purpose	To coordinate review and implementation renewable energy policy
7	Brief description of the project (project summary):	The project entails: i. Regular review of the renewable energy policy ii. Review of Feed-in-Tariff policy and other emerging instruments iii. Appraisal and alignment of project proposals to the prevailing policy priorities iv. Renewable energy demand analysis and planning

8	Project status	New				
9	Estimated project duration (months):	60 months				
10	Estimated project cost in Ksh. Million	FY.2017/18	FY.2018/19	FY.2019/20	FY.2020/21	FY.2021/22
		Kshs. Million				
		-	-	50	50	50
11	Economic and social benefit	Increased access to modern energy services, increased share of renewable energy in the overall national energy supply.				
12	Sources of financing	GOK				

xvi. Renewable Energy Resources Assessment, project pre-feasibility and appraisals

No.	ITEM	Project Code: - New
1	Project name	Renewable Energy Resources Assessment, project pre-feasibility and appraisals
2	Project geographic location	Country wide
3	Project type/Category:	New
4	Implementing organization (s):	Ministry of Energy
5	Counties covered	All
6	Project purpose	To carry out detailed renewable energy resource assessment and development of bankable project pipelines in the Counties with the review to prioritize investments in renewable energy in order to scale up access to clean energy services.
7	Brief description of the project (project summary):	The project entails: v. Detailed renewable energy assessment to establish the exploitable potential; vi. Development of bankable project pipelines required to deepen investment vii. Appraisal of renewable energy project proposals to ascertain their economic, technical and social viabilities as part of project due diligence and pre-approval assessment viii. Monitoring and evaluation of renewable energy projects

		implementation to determine any further interventions that may be necessary in order to ensure consistent scale up of delivery of modern energy services.				
8	Project status	New				
9	Estimated project duration (months):	60 months				
10	Estimated project cost in Ksh. Million	FY.2017/18	FY.2018/19	FY.2019/20	FY.2020/21	FY.2021/22
		Kshs. Million				
		-	-	20	20	20
11	Economic and social benefit	Increased access to modern energy services, increased share of renewable energy in the overall national energy supply.				
12	Sources of financing	GOK				

2. GEO-EXPLORATION DIRECTORATE

i. Geothermal Exploration and Development

1	Project Name	Geothermal Exploration and Development				
2	Project Location	Rift Valley, Coast, Western and Eastern				
3	Project Type:	Mega				
4	Implementing Organization	Ministry of Energy (MoE)				
5	Counties Covered	Nakuru, Turkana, Kajiado, Baringo, Kwale, Makueni, Narok, Homa Bay, Samburu, Turkana				
6	Project Purpose:	The government of Kenya is primarily responsible for providing a high quality of life to all of its citizens, a primary objective of Vision 2030. Key catalyst in achieving this objective is the expansion of sustainable, competitively priced and affordable energy. Geothermal energy has been identified as the most suitable because it is clean energy. Kenya has estimated Geothermal Potential in excess of 10,000MWe. This is yet to be proved through Exploration programme.				
7	Project Description	The key project will feature around geothermal resource exploration and facilitate geothermal development. These activities include: • Development of National Geothermal Strategy • Geological, Geochemical and Geophysical Survey of Kampi Samaki-Soysambu and Soysambu-Kikopey • Establishment of Geothermal Data Repository Centre • Facilitate establishment of African Geothermal Centre of Excellence • Facilitate Stakeholder Engagement				
8	Project Status:	• Reconnaissance survey done in Kampi Samaki • Draft National Geothermal Strategy developed • Terms of Reference for the Geothermal Data Repository Center to be developed for tendering • Legalization process and curriculum development for the African Geothermal Centre of Excellence (AGCE) ongoing. • Interim Project Coordination Unit for AGCE established.				
9	Estimated Project Duration	84 Months				
10	Estimated project cost	Estimate in Millions (1090)				
		FY2017/18	FY2018/19	FY2019/20	FY2020/21	FY2021/22
		Kshs. Million				

		100	150	305	192	192
11	Economic and Social benefits	Availability of quality, reliable, affordable and competitive power. Being indigenous, jobs will be created and savings on Foreign Exchange due to reduction on organic fuels imports.				
12	Sources of financing	GoK				

ii. Geothermal Exploration and Development (Coal)

1	Project Name	Coal Exploration and Development
2	Project Location	Coast, Eastern and Nyanza
3	Project Type:	Medium
4	Implementing Organization	Ministry of Energy (MoE)
5	Counties Covered	Lamu, Kwale, Mwingi, Kitui, Kisumu
6	Project Purpose:	The Government of Kenya has urgent need to increase national electricity generating capacity for transforming Kenya to middle-level economy and has identified coal and natural gas as some of the viable energy resources to be included in Kenya's energy mix to support industrialization.
7	Project Description	The project involve development of Lamu Coal fired Power Plant and Kitui fired power plant, development of Mui Basin coal and coal and methane gas exploration in Karoo system of rocks. Specific activities include: • Development of National Coal Strategy • Drilling, Core Logging & Semi-Feasibility Studies • Carryout geotechnical studies in Kitui, Kwale, Kilifi and Taita Taveta counties • Stakeholders engagements • Develop RAP for Blocks A, B, C & D • Development of Benefit Sharing Agreements (BSA) for block A and B • Facilitate land adjudication of registration of block A, B, C and D • Develop country-wide SEA for coal development program • Facilitate development of Lamu Coal Fired Power Plant
8	Project Status:	1. Lamu power Plant Most of the paper work is complete. What remains before the construction of the plant include:

		• ESIA and RAP implementation. • Stakeholder engagement • Facilitation of Steering, Technical & Community Committees (20%) 2. Mui Basin coal development • Process of Concessioning of Block A, B, C& D on going • Facilitation of liason committee ongoing 3. Coal & Coal Bed Methane Studies in Karoo System (Kwale, Kilifi, TaitaTaveta & Southern Kitui) and Kisumu • Feasibility studies ongoing • Drilling and Core Logging ongoing
9	Estimated Project Duration	84 Months
10	Estimated project cost	Estimate in Millions (980)
		FY2017/18 FY2018/19 FY2019/20 FY2020/21 FY2021/22
		Kshs. Million
		140 148 252 251 250
11	Economic and Social benefits	Availability of quality, reliable, affordable and competitive power. Being indigenous, jobs will be created and savings on Foreign Exchange due to reduction on organic fuels imports.
12	Sources of financing	GoK

iii. Nuclear fuel resources exploration and development

1	Project Name	Nuclear fuel resources exploration and development
2	Project Location	Coast, Turkana, Samburu and Nyanza
3	Project Type:	Medium
4	Implementing Organization	Ministry of Energy (MoE)
5	Counties Covered	Turkana, Kisumu, Samburu, Mombasa, Kwale, Kilifi, Kajiado, Narok and Nakuru
6	Project Purpose:	Nuclear Power Plant is provided for in the country's energy and power generation mix leading to the realization of Vision 2030. The Country's power need is estimated to be more than 17,000MW. Such a huge demand requires the development of nuclear energy in the country.
7	Project Description	The project involves exploration of nuclear fuel resources and facilitation of the development and establishment of nuclear plant. Specific activities include:

		• Development of National Nuclear fuel development strategy • Development of Nuclear policy and Nuclear Regulatory Bill • Geological, geochemical and geophysical exploration of the resources • Participate in preliminary Studies on Power Plant sitting				
8	Project Status:	Zero draft National Nuclear fuel development Strategy available Geological, geochemical and geophysical exploration of the resources ongoing				
9	Estimated Project Duration	The project kicked off in the financial year 2016/2017 and is expected to end in the financial year 2020/2023				
10	Estimated project cost	Estimate in Millions (820)				
		FY2017/18	FY2018/19	FY2019/20	FY2020/21	FY2021/22
		Kshs. Million				
		0	135	239	223	220
11	Economic and Social benefits	Availability of quality, reliable, affordable and competitive power. jobs will be created and savings on Foreign Exchange due to reduction on organic fuels imports.				
12	Sources of financing	GoK				

3. ELECTRICAL POWER DIRECTORATE

i. NATIONAL ELECTRIFICATION MANAGEMENT PROGRAM

No	ITEM																
1	Project name	National Electrification Management Program															
2	Project geographic location	Across the Country															
3	Project type/Category	Electricity Access/Mega Project															
4	Implementing organizations	Ministry of Energy (MoE), KPLC, REA, KETRACO															
5	Counties covered	All Counties															
6	Project purpose	The purpose of the program is to accelerate electricity access from 69.45% in 2017 to universal access by the year 2022 as envisioned in the MTP III. The project is an enabler of the Big 4 Agenda															
7	Brief description of project	This program entails a national, inclusive approach to rapidly increase electricity service to households, public institutions and businesses throughout country at acceptable levels and quality of service. It focus on minimum level of service for off-grid; establishment of coordinated planning framework; Integration of lower-cost design approaches for grid expansion; and defining roles and responsibilities of the key stakeholders. The program also involves establishment of an Electrification Program Management Unit (EPMU) responsible for driving the implementation of the National Electrification Strategy. The EPMU will be responsible for evaluating the role that grid expansion, mini-grid, and stand-alone off-grid systems will contribute to the overall electrification expansion program. The EPMU will also be the principal agency responsible for the oversight and management of off-grid implementation process. The team will oversee off-grid planning; design, procurement and construction; as well as monitoring of program progress.															
8	Project status	The program is new and is at preliminary stages															
9	Estimated project duration	36 months															
10	Estimated Project cost	<table><tr><td>FY.2017/18</td><td>FY.2018/19</td><td>FY.2019/20</td><td>FY.2020/21</td><td>FY.2021/22</td></tr><tr><td colspan="5">Kshs. "Million"</td></tr><tr><td>-</td><td>-</td><td>35</td><td>35</td><td>35</td></tr></table>	FY.2017/18	FY.2018/19	FY.2019/20	FY.2020/21	FY.2021/22	Kshs. "Million"					-	-	35	35	35
FY.2017/18	FY.2018/19	FY.2019/20	FY.2020/21	FY.2021/22													
Kshs. "Million"																	
-	-	35	35	35													
11	Economic and social benefits	➤ Improved coordination of project will lead to efficient and effective utilization of resources which in turn will help in achieving the National Electrification Strategy objectives. ➤ Universal access to electricity is expected to spur growth of															

			businesses; this will create demand for other goods and services hence promoting accelerated growth in the economy. ➤ Creation of small businesses will accelerate job creation leading to improved economic well-being of Kenyans. Building of service lines will also create a considerable number of jobs. ➤ Access to electricity at the household level and schools will lead to betterment of education services, children will have an opportunity to extend their study time and laboratories in schools will be well equipped and use of ICT will be promoted. ➤ There will be reduction of pollution associated with use of kerosene and wood fuel. ➤ A reduction in reliance to wood fuel will lead to reduced destruction of forests. ➤ Improved standards of living will be realized as customers will now be able to use electricity appliances. ➤ Security will be enhanced arising from well-lit social, commercial and individual premises. ➤ Improved communication amongst communities and connectivity to global facilities through internet and mobile technology.
12	Sources of financing	of	Government exchequer

ii. POWER SYSTEM PLANNING

No	ITEM	
1	Project name	Power System Planning
2	Project geographic location	Countrywide
3	Project type/Category	Technical Research and appraisal studies/Medium
4	Implementing organizations	MoE
5	Counties covered	All counties
6	Project purpose	The purpose is to update the Power generation and transmission master plan. The main objective of the update is to take into account updated assumptions, new technologies as well as market dynamics that may impact on future power expansion plan. The project will also carry out technical Research and appraisal studies on implementation of regional

		power interconnection projects. This is in line with the MTP III and is an enabler of the Big 4 agenda and Vision 2030.				
7	Brief description of project	The project will involve updating of the Power generation and transmission master plan. Activities include data collection and analysis to support electricity demand forecasting, generation and transmission planning, modelling using the analyzed data in order to predict the operation of the power system, Investment analysis on the models summarizing financial implications. The activities will be carried out through working group meetings and field visits, workshops. The project will also undertake technical research and appraisal studies on implementation of regional power interconnection projects and facilitation of regional working groups.				
8	Project status	New				
9	Estimated project duration	Each financial year				
10	Estimated Project cost	FY2017/18	FY2018/19	FY2019/20	FY2020/21	FY2021/22
		Kshs. Million				
		-	-	25	20	25
11	Economic and social benefits	Economic and Social benefits: Security of power supply through least cost power generation planning. This will result to quality, reliable, affordable and competitive electrical power for economic and social development				
12	Sources of financing	Exchequer				

Annex II: Analysis of Performance of Capital Project For FY 2017/18 (Amount in Kshs. Million)

The table below summarizes the performance of Ministry capital projects in terms of the estimated cost of the project, timelines, budget allocation cumulative expenditure and the percentage completion rate for the period 2017/18. The projects are organized in terms of the programme.

Programme Code and Project Title	Total Estimated cost of project (Kshs. Millions)	Estimated Cost of the Project (Financing)		Timeline		FY 2017/2018				REMARKS	
		GOK	Foreign	Start date	Expected completion date	Approved foreign budget	Approved Gok Budget	Cumulative Expenditure As at 30th June 2018	Completion Stage as at 30th June 2018		
A. POWER GENERATION											
1. Exploration and Development											
1152107601 Nuclear fuel resources exploration and development	600	600	0	Jul-16	Jun-22	-	100	18	40%	institution put in place to accelerate implementation	
115206501 Geothermal Exploration and development in rift valley	798	798	0	Jul-16	Jun-22	110	157	251	25%	project on course	
1152106503 Coal Exploration and development in coast	730	730	0	Jul-16	Jun-21	-	245	79	40%	project on course	
Total Exploration and Development	2128	2128	0			110	502	348			
2. Geothermal Development											
1152100801 Olkaria I and IV (Geothermal)	8,077	0	8,077	Oct-16	Jul-20	-	0	0	10%	Project is in mobilization stage	

Programme Code and Project Title	Total Estimated cost of project (Kshs. Millions)	Estimated Cost of the Project (Financing)		Timeline		FY 2017/2018				REMARKS
		GOK	Foreign	Start date	Expected completion date	Approved foreign budget	Approved Gok Budget	Cumulative Expenditure As at 30th June 2018	Completion Stage as at 30th June 2018	
1152101703 Kenya Electricity Generating Company(KEEP)	86,536			Olkaria I unit 4&5 and Olkaria IV-12th Jan.2013 and 12th Sept.2012	Olkaria I unit 4&5 and Olkaria IV-12th Jan.2016 and 12th Sept.2015	-	0	0	100%	Project is Complete
1152104801 Olkaria V (Geothermal)	24,027	0	24,027	Jun-15	Jul-19	800	0	4,482	63%	Project is ongoing
1152101500 Drilling of Olkaria IV Geothermal Wells	45,650		38,803	Sep-12	Mar-16	-	0	0	100%	Project is Complete
1152100501 Bogoria Silali Geothermal Projects	78,029	46,940	31,089	Jun-10	Jun-28	800	750	4,419	20%	Access road construction complete. Water Supply System, civil and installation of equipment, construction of water tank bases 63% complete.update of ESIA Report ongoing
1152100901 Support for the Development of Renewable Energy	115,926	90,845	25,081	Jan-10	Aug-27	-	0	61,949	35%	Drilling & Testing for 105 MW phase 1 complete.Steam Gathering system 96% Complete; Pipeline cladding and final installation ongoing. IPTs to provide GDC with a notice of financial close. QFEA has engaged AfDB for financing and the bank is currently undertaking project due diligence. Sosian and Or Power 22 Limited (OTT) are in the process of obtaining project financing.
1152102201 Menengai Geothermal Development Project.						1,596	1921			
1152104901 460MW							3,000			

Programme Code and Project Title	Total Estimated cost of project (Kshs. Millions)	Estimated Cost of the Project (Financing)		Timeline		FY 2017/2018				REMARKS
		GOK	Foreign	Start date	Expected completion date	Approved foreign budget	Approved Gok Budget	Cumulative Expenditure As at 30th June 2018	Completion Stage as at 30th June 2018	
Menengai Project										
300MW Suswa geothermal project	78,029	62,332	15,698	Jan-14	Dec-33			325	2%	Geoscientific studies done. Funding from Italian International Development Agency (IDA) secured pending signing of a funding agreement. Resolution of an arbitration with a former allottee of the field ongoing.
Total Development	271,984	200,117				3,196	5,671			
3. Nuclear Energy Development										
11521050001 Grid evaluation and analysis	304	304	-	Nov-18	Mar-18		0	0	100%	Project Complete
1152105501 Nuclear Power Plant Siting	1,500	1,500	-	Jul-15	Jun-22	-	114	197	25%	The project has been underfunded since inception.
11521052001 Strategic Environmental Assessment.	460	460	-	Jul-16	Jun-20	-	157	200	48%	The project has been underfunded and is running late as per the projections

Programme Code and Project Title	Total Estimated cost of project (Kshs. Millions)	Estimated Cost of the Project (Financing)		Timeline		FY 2017/2018				REMARKS
		GOK	Foreign	Start date	Expected completion date	Approved foreign budget	Approved Gok Budget	Cumulative Expenditure As at 30th June 2018	Completion Stage as at 30th June 2018	
1152107500 Curriculum Development for Nuclear Courses	4,000	4,000	0	Jul-16	Jun-25	-	0	18	10%	The project is on course
Nuclear Policy and Legislation	3000	3,000	0	Jul-17	Jun-22	-	0	10	1%	The project has been underfunded since inception.
Total Nuclear Development	9,264	9,264	0			-	271	425		
Total Generation	482,433	211,726	225,010			3,306	6,444	773		
B. POWER TRANSMISSION AND DISTRIBUTION										
1. National Grid System										
1152108101 Kamburu-Embu-Thika transmission line							2,651	2,651	1%	Need budget provision
1152100701 Mombasa - Nairobi Line	24,548	8,149	16,399	Dec-10	Jul-17	1,900	263	19,217	100%	The project was completed in August 2017 with cost overruns payable to the contractor due to delays in acquisition of ROW.

Programme Code and Project Title	Total Estimated cost of project (Kshs. Millions)	Estimated Cost of the Project (financing)		Timeline		FY 2017/2018				REMARKS
		GOK	Foreign	Start date	Expected completion date	Approved foreign budget	Approved Gok Budget	Cumulative Expenditure As at 30th June 2018	Completion Stage as at 30th June 2018	
11521037001Mariakani Substation	2,960	438	2522	Jul-17	Oct-21	-	46	205	1%	The amount was spent on acquisition of SS land. The completion date is dependent procurement of a Contractor pending confirmation of financing arrangement after which the Estimated Project cost will be split between Foreign & GOK
1152100401 Loiyangalani – Suswa	28,907	21,715	7,192	Oct-14	Aug-18	223	5,617	19,299	90%	Project is complete. However, bills relating to materials and contractors payments are still outstanding
1152102401Lessos - Tororo (Equatorial Nile lake grids)	8,809	3,609	5,200	Jul-13	Dec-21	-	79	5,618	45%	The completion date is dependent on the conclusion of the pending law suit.
1152101001 Nairobi Ring (Suswa – Isinya and substations)	24,837	4,597	20,240	Oct-12	Apr-21	303	361	12,178	71%	The transmission line was completed and energized in July 2017. New contractor was procured to complete the substations.
11521101301 Olkaria - Lessos – Kisumu	18,200	3,900	14,300	Feb-16	Sep-21	1,112	263	9,057	65%	In progress and is 65% complete

Programme Code and Project Title	Total Estimated cost of project (Kshs. Millions)	Estimated Cost of the Project (Financing)		Timeline		FY 2017/2018				REMARKS
		GOK	Foreign	Start date	Expected completion date	Approved foreign budget	Approved Gok Budget	Cumulative Expenditure As at 30th June 2018	Completion Stage as at 30th June 2018	
1152101801 Eastern Electricity Highway Project (Ethiopia-Kenya Interconnector)	63,728	5,351	58,377	Aug-18	Jun-18	3,692	305	24,727	75%	There were delays by contractor in Civil works who is under Receivership leading to termination of this contract for the Converter Station. The contract has since been awarded to Siemens Germany.
11521040001 Machakos – Konza – Kajjido - Namanga	4,342	1,312	3,030	Dec-13	Jun-20	300	110	2,932	70%	Low progress due to high community expectation and lack of community support for project especially between Isinya and Namanga leading to frequent stoppages along the Line. There is also limited Budget allocation from GOK for way/leave compensation.
1152101401 Turkwel – Ortum – Kitale	4,597	1,777	2,820	Dec-13	Jun-21	312	-	3,496	78%	

Programme Code and Project Title	Total Estimated cost of project (Kshs. Millions)	Estimated Cost of the Project (financing)		Timeline		FY 2017/2018				REMARKS
		GOK	Foreign	Start date	Expected completion date	Approved foreign budget	Approved Gok Budget	Cumulative Expenditure As at 30th June 2018	Completion Stage as at 30th June 2018	
1152103101 Multi-National Kenya-TZ power	3,792	1,020	2,772	Feb-17	Sep-21	50	18	737	25%	Section 5.0.2 of the Loan agreement requires KETRACO to provide evidence of compensation to PAFs prior to commencement of construction in any section. Construction works are set to begin once compensation is made. The project needs budget allocation to facilitate acquisition of ROW
1152100301 Sondu -Homa Bay -Awendo	3,171	1,371	1,800	Oct-15	Jun-20	200	76	1,063	61%	Completion date to be extended to October 2018 due limited allocation of counterpart funding (GOK). Additional GOK funds sought to complete wayleave compensation

Programme Code and Project Title	Total Estimated cost of project (Kshs. Millions)	Estimated Cost of the Project (Financing)		Timeline		FY 2017/2018				REMARKS
		GOK	Foreign	Start date	Expected completion date	Approved foreign budget	Approved Gok Budget	Cumulative Expenditure As at 30th June 2018	Completion Stage as at 30th June 2018	
115200201 Nanyuki-Isiolo-Meru.	5,588	3,778	1,810	Oct-12	Jun-20	-	165	2,783	90%	Department of defence through Laikipia Airbase objected to Ketraco's infrastructure of pylons around their training facility (Laikipia Airbase) in Nanyuki. They recommended for underground cable since they had relocated their training facility from Eastleigh to Laikipia making the overhead cables unsafe for their trainees. Ketraco is expected to change from the overhead cable to underground on a 10km stretch where 4km is shared under KPTSIP. The remaining 6km stretch requires procurement of the underground cable at an estimated cost of USD 15million plus additional monies for wayleave compensation. TNT is to issue a letter to fund the same under ADB savings in Ethiopia Kenya after which Gok funding requirement will be adjusted
					124					

Programme Code and Project Title	Total Estimated cost of project (Kshs. Millions)	Estimated Cost of the Project (Financing)		Timeline		FY 2017/2018				REMARKS
		GOK	Foreign	Start date	Expected completion date	Approved foreign budget	Approved Gok Budget	Cumulative Expenditure As at 30th June 2018	Completion Stage as at 30th June 2018	
11521038001Rabai Malindi-Garsen - Lamu .	10,064	1,724	8,340	Dec-10	Dec-15	-	59	10,024	100%	Complete

Programme Code and Project Title	Total Estimated cost of project (Kshs. Millions)	Estimated Cost of the Project (Financing)		Timeline		FY 2017/2018				REMARKS
		GOK	Foreign	Start date	Expected completion date	Approved foreign budget	Approved Gok Budget	Cumulative Expenditure As at 30th June 2018	Completion Stage as at 30th June 2018	
11521039001 Power Transmission System Improvement project.	10,749	4,046	6,703	Sep-13	Dec-19	-	127	8,500	70%	The contractor Jyoti Structures was not able to progress on their construction works on the TLs due to cashflow constraints which led to delays in absorption. We have since released to them retention monies and received an additional performance guarantee for draw down of retention monies to enhance progress of construction works. This contract has since been terminated (Sep'18) and progress will only be made once a new contractor is procured
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Programme Code and Project Title	Total Estimated cost of project (Kshs. Millions)	Estimated Cost of the Project (Financing)		Timeline		FY 2017/2018				REMARKS
		GOK	Foreign	Start date	Expected completion date	Approved foreign budget	Approved Gok Budget	Cumulative Expenditure As at 30th June 2018	Completion Stage as at 30th June 2018	
Kenya Off-Grid Solar Project (REA)	3,500		3,500	Jul-18	Jun-22	51	-	-	0%	This will finance the construction of solar minigrids in off-grid areas. The financing agreement is due for execution in September 2017
Electrification of Water facilities	16,000	16,000		Jul-18	Jun-23	-	-	-	0%	This will be done in partnership with the Ministry of Water and Irrigation. The target is to electrify 2,000 water point installations within 2 years
Connection of Households	45,750	45,750		Jul-18	Jun-23	-	-	-	0%	The target is to connect 3 Million households by June 2023.
Total Rural Electrification	168,205	140,612	27,593			8,486	8,437	54,072		
Total Power Transmission And Distribution	377,927	196,114	180,773			27,937	28,829	112,183		
C. ALTERNATIVE ENERGY TECHNOLOGIES										
1152106001 Construction of institutional biogas plants.	252	252	0	Jul-14	Jun-22		38	29.4	50%	
1152105301 Lake Turkana Wind power Project.	3,100	3,100		Jan-15	Jan-18		7,019	7,019	92%	In addition to the project taxes, Government allocated funds to pay in lieu of delayed power evacuation.
1152107300 Sustainable Energy for All	180		180	Jan-18	Jun-22	-	-	-	0%	

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1152105401 Hydro dams Water catchment re-afforestation.	640	640	0	Jul-14	Jun-22		60	375	63%	
1152105501 Solar PV installation on Institutions and or community boreholes	2,020	2,020	0	Jul-14	Jun-22		186	1091	50%	
1152105601 Development of Community Small Hydro Power projects.	300	300		Jul-14	Jun-12		25	87	10%	
1152105701 Renewable Energy Technology Innovation upscaling (Solar refrigeration.	150	150		Jul-14	Jun-19		-	0	5%	
1152105801 Installation of wind masts & data loggers and rehabilitation of pre.	400	400		Jul-14	Jun-22		30	169	50%	
1152105901 Energy Efficiency Programme (Investment Grade Audits.	210	210		Jul-14	Jun-20		35	140	80%	
1152106100 Pilot programme on Domestic household biogas digesters (upscaling b.	500	500		Jul-15	Jun-22		92	103	17%	
1152106300 Biofuel value chain development.	70	70		Jul-14	Jun-22		6	11	50%	
1152106400 Energy Efficient Charcoal Kilns Development.	30	30		Jul-18	Jun-22		3.5	5	40%	

Programme Code and Project Title	Total Estimated cost of project (Kshs. Millions)	Estimated Cost of the Project (financing)		Timeline		FY 2017/2018					REMARKS
		GOK	Foreign	Start date	Expected completion date	Approved foreign budget	Approved Gok Budget	Cumulative Expenditure As at 30th June 2018	Completion Stage as at 30th June 2018		
1152101702 Kenya Power and Lighting Company(KEEP)	12,000	-	12,000	Jan-10	Sep-17	1,127	-	0	100%	complete	
1152100101 Juja road Electricity Power S/S	2,640	-	2,640	Feb-18	Jun-18	600	0	2,640	100%	complete	
1152103400 Transformer Densification	1,680		935	Jan-17	Dec-18	-	-	741	65%	The project is on-going after the initial delays at in procurement stage and planned to end by Dec 2018 the budget thus to be considered in 2018/2019	
1152103300 Compact fluorescent lamps	1,560	330	935	Mar-14	Jun-18	-	-	0	100%	completed	
1152103202 Kenya Electricity Modernization project	24,800	-	24,800	Jan-17	Jun-21	3,400	-	3,841	30%	Contracts awarded and Advance payments made/under process. Budgetary constraints are faced	
1152107001 Prepaid solar charging systems and rechargeable Lanterns-Lodwar solar.	440	-	440	Nov-15	Nov-19	110	0	272	50%	The Component of Prepaid Solar Charging system and rechargeable lanterns is complete, however the Lodwar Solar Power is at the procurement stage (Contract award)	
1152101601 Nairobi 132kV and 66kV network upgrade and reinforcement	13,200	-	13,200	Dec-15	Dec-19	-	0	8,567	92%	The project is on course. The contract end date extended to July 2018. The project is expected to be complete by Dec 2018. Progress affected by Budgetary constraints	

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		GOK	Foreign	Start date	Expected completion date	Approved foreign budget	Approved Gok Budget	Cumulative Expenditure As at 30th June 2018	Completion Stage as at 30th June 2018			
11521041001 Menengai - Soilo.	1,868	1,868	0	May-14	Dec-16	-	129	1,544	100%	Complete pending bills and wayleave compensation		
11521042001Kilimanbogo-Thika-Githambo.	3087	956	2,131.37	Jan-11	Nov-13	-	9	3,028	100%	Complete		
11521043001Mumias-Rangala.	1,350	1,350	-	Dec-10	Jul-12	-	13	1,261	100%	Complete		
1151101705 Kenya Electricity Expansion Programme (KEEP)	4,529	4,529	-	Aug-12	Sep-17	-	155	3,292	95%	Cost overruns due to stoppages, Estimated Costs to be revised to include pending bills relating to acquisition of ROW		
1152107901 Kenya Power Transmission Expansion Project	13,228	4,233	8,995	Nov-17	May-20	-	102	1,525	1%			
1152107801 Kenya Power Distribution System & Modernization Project Phase II - Garsen - Hola - Garissa	11,415	3,653	7,762	Oct-17	Sep-20	475	-	1,774	1%	Needs Exchequer allocation. Expenditure is advance payment to the Contractor		
1152102701 Last mile connectivity	107,600	27,600	80,000	Dec-15	Dec-20	3,214	4,968	20,135	30%	The project is being implemented in phases. Phase I is at 68% completion state. Phase II commenced in March 2017 and is at Contract award stage - is on course. Phase III is at the procurement stage and financing agreement has been signed.		

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		GOK	Foreign	Start date	Expected completion date	Approved foreign budget	Approved Gok Budget	Cumulative Expenditure As at 30th June 2018	Completion Stage as at 30th June 2018	
1152101101 Scaling-up access to Energy (Stima Loan)	4,650	-	4,650	Jan-14	Dec-20	1,791	-	2,450	15%	Stima loan uptake affected by the introduction of the Last Mile Project which is cheaper and easier to access-
11521035001 Streetlighting.	17,798	17,798	0	Jan-16	Jun-21		2,713	10,598	38%	
1152103601 Connectivity Subsidy.	9,774	9,774	-	Jan-16	Jun-22	-	2,163	5,787	46%	
1152107201 Retrofitting of Mini Grids	3,080	-	3,080	Jan-19	Mar-21	100	0	3,080	10%	Contracts for Consultancy Signed, Tender Specification under development
1152107100 Nairobi City Centre E.H.V and 66KV Network Upgrade and Reinforcement	10,500	-	10,500	Jan-19	Mar-21	500		0	0%	Project is to support Nairobi 132kV and 66kV network upgrade and reinforcement.
1152108002 KOSAP (KPLC)						42				
Total National Grid System	209,722	55,502	153,180			19,451	20,392	58,111		
2. Rural Electrification										
1152101704 Kenya Electricity Expansion Project (REA)	3,050		3,050	Jul-12	Jun-17	-		3,050	100%	Project completed
1152103001 Garissa 50MW Solar Project	13,578		13,578	Aug-15	Jun-19	7,800	-	12,853	75%	Project on schedule to be completed in October 2018

Programme Code and Project Title	Total Estimated cost of project (Kshs. Millions)	Estimated Cost of the Project (Financing)		Timeline		FY 2017/2018				REMARKS
		GOK	Foreign	Start date	Expected completion date	Approved foreign budget	Approved Gok Budget	Cumulative Expenditure As at 30th June 2018	Completion Stage as at 30th June 2018	
1152103203 Kenya Electricity Modernization Project-HQ	1,100	-	1,100	Jul-16	Jun-19	350		129	12%	There was a delay in the procurement of the transaction advisor which effectively delayed the procurement of the IPP's. The tender documents are ready for advertisement in September 2017
11521044001 Electrification of Public Facilities	65,257	58,892	6,365	Jul-12	Jun-21	285	5,193	27,713	42%	The project progress is limited to the resources availed through the budgetary allocation which has so far been fully absorbed.
11521045001 Turkwel - Lokichar 66KV Line	1,652	1,652	-	May-16	Jul-17	-	150	1,351	82%	The 66KV line and the substations have been completed. Laying of the OGW cable is pending.
11521046001 Solar Maintenance Programme	675	675		Jul-17	Jun-20	-	18	30	4%	This is a continuous project whose progress is limited to the budgetary allocation in a given financial year. So far, all the funds allocated and disbursed have been absorbed.
1152104701 Off-grid Diesel Power Stations	2,643	2,643	-	Jul-14	Jun-17	-	451	2,596	98%	The project has been completed and the allocation for 2017/18 will finance the payment of retentions.
1152106901 Installation of transformers in constituencies	15,000	15,000	-	Jul-16	Jun-21	-	2,625	6,350	42%	Project on course as scheduled. All the funds so far allocated and disbursed have been fully absorbed.

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1152106200 Expansion of Energy centres .	1038	1038		Jul-18	Jun-22	-	155	323	70%	The expenditure on energy centres will be taken over by REA effective 1st July 2019 once the Energy Bill 2017 is enacted. This is a continuous activity and the estimated cost relates to the MTEF period only.
1152108001 Kenya Off-Grid solar access programme for underserved counties	15965		15965	Jul-17	Jun-23	372	-	8	1%	
Total Alternative Energy Technologies	24,855	8,710	16,145			372	7,650	9,360		
D. ADMINISTRATION, PLANNING AND SUPPORT SERVICES										
1152103201 Kenya Electricity Modernization Project(KEMP) HQs.	413	13	400	Jan-17	Jun-21	91	3	85	60%	
1152106701 Integrated energy sector information management system project						-	-	-		
1152101706 Kenya Electricity Expansion Project (KEEP)HQs.	713	93	620	Jan-10	Dec-17	214	30	0	100%	
1152100601 Technical assistance to the ministry	491	49	442	Jul-12	Jun-17	-	0	0	100%	
								-		
1152106800 Energy Flagship Projects Monitoring and Evaluation Programme.	141	141	0	Jul-17	Jun-21		77	81	100%	

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Total Administration, Planning and Support Services	1,758	296	1,462			305	110	166	4	
TOTAL STATE DEPARTMENT OF ENERGY	1,187,128	416,846	423,390			31,920	43,033	122,482	37	

ANNEX III: Pictorial Representation of Some of Energy Projects



300MW Lake Turkana wind Power Project



400kV Loiyangalani - Suswa transmission line



Energy Cabinet Secretary Hon. Charles Keter launches the Last Mile Project in Garissa County



Sundu Miriu hydropower dam and re-afforested surrounding



Section of Mui Basin Coal Field



Geothermal drilling rig at Menengai field

