



Ministry for Foreign Affairs, Finland

# FINAL REPORT

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FCG Finnish Consulting Group

Ex-Post Evaluation of  
Concessional Credit  
Scheme Project:  
*"The Juja Road  
Substation Renewal  
in Kenya"*



Ministry for Foreign Affairs

## **Ex-Post Evaluation of Concessional Credit Scheme Project: The Juja Road Substation Renewal in Kenya**

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AIS	Air Insulated Switchgear
ABB	Asea Bron and Boveri
CCS	Concessional Credit Scheme
DAC	Development Assistance Committee
DC	Direct current
EPA	Electric Power Act
EPC	Engineering Procurement Construction
ESPR	Energy Sector Recovery Project
ERB	Electricity Regulatory Board
ERC	Energy Regulatory Commission
ERSWEC	Economic Recovery Strategy for Wealth and Employment Creation
FCG	Finish Consulting Group
Finnvera	Finnish Export Credit Agency
FS	Feasibility study
GHG	Greenhouse gas
GIS	Gas Insulated Switchgear
GOK	Government of Kenya
HV	High Voltage
km	Kilometer
KENGEN	Kenya Electricity Generating Company
KETRACO	Kenya Electricity Transmission Company Limited
KPI	Key Performance Indicators
KPLC	Kenya Power and Light Company
kV	Kilovolt
LV	Low Voltage
MFA	Ministry of Foreign Affairs of Finland
MVA	Mega Volt Ampere
NCCAP	National Climate Change Action Plan
NDC	Nationally Determined Contribution
NEP	National Energy Policy
OECD	Organization for Economic Cooperation and Development
O&M	Operation and maintenance
PIF	Public Sector Investment Facility
REP	Rural Electrification Program
SCADA	Supervisory Control and Data Acquisition
SWG	Switchgear
T&D	Transmission and distribution
TCO	Total Cost of Ownership
TOR	Terms of reference
WB	World Bank

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## Executive summary

### Introduction

The present ex-post evaluation of the Juja Road Substation Renewal Project in Nairobi, Kenya, “The Project”, funded through the Concessional Credit Scheme (CCS), is part of the Ministry for Foreign Affairs of Finland (MFA) efforts to strengthen the focus on development results and lessons learnt from CCS projects to support the programming, development, and management of the Public Sector Investment Facility (PIF) instrument.

According to the Terms of Reference (TOR), the overall objective of the end of project evaluation is:

- To provide an external, independent and objective assessment of the project.
- To enable the MFA to evaluate whether the project was implemented in:
  - 1) An appropriate and efficient way;
  - 2) How well it achieved the targets and goals laid out in the project plan; and
  - 3) Particularly how sustainable the results of the project are, including the long-term development impacts of the project.
- To provide the MFA with lessons-learned that can be used in further development of the PIF funding instrument; and
- To generate information for the MFA on the development impact of the CCS funded projects and the sustainability of these results.

### Brief Project Description

According to Hitachi-ABB and KPLC, the Juja Road Substation Renewal, included full modernization of equipment at 132/66/11kV voltage levels using indoor Gas Insulated Switchgear (GIS) technologies, including new power transformers and all auxiliary services. The substation increased after completion of related works and service its transmission and distribution (T&D) capacity from 255 MVA to 360 MVA, while improving by 90% its level of reliability.

### Design of the Ex-Post Evaluation

**Evaluation Criteria:** It included, (i) relevance; (ii) effectiveness; (iii) efficiency; (iv) impact; (v) sustainability; and (vi) coherence.

**Evaluation Methodology:** It has combined a mix of methods for data collection and analysis, utilizing both primary and secondary data sources. Specifically:

**Desk Review of Secondary Data:** The evaluation team reviewed Project documents received from the MFA of Finland, the Finnish contractor Hitachi-ABB in Finland, the Finnish loan guarantee provider FINNVERA, the Project Owner, the power utility KPLC in Kenya, as well as Kenyan and Finnish policy documents that are publicly available. Of specific relevance was the technical information drafted in the Project Feasibility Study

of November 2005. The analysis conducted by the evaluation team included stakeholder assessment, in Finland and in Kenya, covering a time-span of 17 years, starting from the project planning in 2005, until the present situation in 2022.

**Primary Data Collection:** The evaluation team collected all relevant data with incumbent stakeholders through a video interview on 31 August 2022 with Hitachi-ABB, and during the field mission to Nairobi during 27-30 September 2022 through face-to-face interviews with KPLC, Embassy of Finland in Nairobi, and European Investment Bank (EIB) in Nairobi.

For primary data collection, the evaluation team created a structured evaluation questionnaire for collecting information first through interviews and discussions, and then complemented by asking the respondents to provide written responses to ensure that data is collected systematically. The written responses were duly submitted by Hitachi-ABB and KPLC.

The primary data assessment included the background, scope, planning and implementation phases of the Project, and the power sector context of Kenya.

**Data Analysis:** Of special relevance, was to find out all actions taken to ensure long-term sustainability of results after the completion of the Project. The assessment of the effectiveness and efficiency of the project, or to what extent the project reached its objectives with the resources available to it, consists in measuring the obtained results against the initially expected results drafted in a pre-designed Results Framework.

Unfortunately, within the previous concept of the CCS instrument, such tools were not required. The recommendation to apply Results Framework (Logical Framework) was introduced in the new PIF instrument from 2016 onwards. Hence, the evaluation team has re-constructed a Results Framework for the project, including outputs, outcomes, and impacts achieved.

**Limitations, Risks, and Mitigation:** During the field mission, the evaluation team encountered lack of effective support from KPLC management, as only one interview was confirmed on a short notice when the evaluation team's international energy expert arrived to Nairobi and visited KPLC. Much needed project documents and key data, like supply and demand load, power generation, and power outages profiles were in principle promised by KPLC to be shared, but eventually only partially submitted, even after several follow-ups. Such kind of limitations are not uncommon in ex-post evaluations of this type.

As a mitigation measure to filling-up the gaps and to complete the evaluation exercise, compatible alternative sources of data, and other valid standard references like industrial good practices and interpolation have been used, including the data gathered during the interviews, as the evaluation team could still talk with the same key personnel at KPLC in Nairobi, and at Hitachi-ABB in Finland who managed the implementation of the renewal of the Juja Road Substation.



### Summary of Findings, Conclusions and Recommendations

	Findings	Conclusions	Recommendations
<b>RELEVANCE</b>	<p>1. <b>Benefit of Electricity services:</b> The Project has been having a key relevance in improving electricity services in the Nairobi area and beyond at national level, in addition to benefit with stable, secure and reliable power supply to residential, commercial, and industrial consumers</p> <p>2. <b>Kenyan and Finnish, Development and Climate Goals:</b> Achieving national development goals can be materialized if electricity services with good quality are made available in sustainable, cost-effective and affordable manner to all relevant sectors of the economy. Sustainable investments therefore, should address SDG1 (no poverty), SDG 6 (energy for all), and SDG 13 (climate action).</p>	<p>Since its final commission in 2018 formally sealed with the operational certification document, the Project has demonstrated a most relevant contribution to provide modern and efficient electricity services. Being relevant in improving electricity services in the Nairobi area and beyond at national level with stable, secure and reliable power supply to consumers.</p>	<p><b>Recommendation 1: Project Preparation Phase</b></p> <p><u>Project Budgeting:</u> The Ministry of Foreign Affairs (MFA) is advised to use the modality of project portfolios, instead of individual actions.</p> <p><u>Networking with the Development Partner community:</u> The role of the Embassy of Finland (EOF) should be strengthened, as project syndication creates needed synergies in terms of budgeting and expertise, while optimizing risk management.</p>
<b>EFFECTIVENESS</b>	<p>3. <b>Improvement of Supply of Electric Power to Beneficiaries:</b> By stabilizing the national power T&amp;D power system to a large degree, contributing to a versatile and customized end-user service resulting in an uninterrupted electricity service.</p> <p>4. <b>Increased and Improved Reliability of Electricity Supply and New Additional Connections</b> The quality and capacity of the Juja Road Substation was substantially increased, which has helped to eliminate almost in 90% power outages and increased the capacity to serve additional customers.</p>	<p>The Project has been able to supply to approximately 50% of the population of the metropolitan area of Nairobi, which is estimated to be around 9,4 million according to the 2019 census, hence fulfilling the effectiveness criteria of significantly improving, in terms of quantity and quality, the supply, and reliability of electricity services.</p>	<p><u>Project Promotion:</u> The MFA in coordination with the Finnish Chamber of Commerce/Industry, potential contractors, and manufacturers should promote Finnish technological solutions in form of technical missions to the target countries.</p>

	Findings	Conclusions	Recommendations
	<p>5. <b>Key Success Factors for Achieving Project Objectives and actors:</b> Well-designed management and O&amp;M training provided by the EPC contractor, has made possible supply of stable, reliable and modern electricity services to consumers, which has been contributing to the Kenyan social, economic, environmental, and climate development goals. The MFA, FINNVERA, and Nordea Bank in Finland, provided supported funding. The Embassy of Finland in Nairobi was the liaison among Finnish and Kenyan actors. Treasury, MOEP, KPLC in Kenya, supervised financial and technical aspects.</p>		<p><u>Appropriate Project Feasibility at Early Stage:</u> It is recommended to the MFA to engage third party engineering for assessment, and due-diligence, which will lead to shorter and efficient timing. <b>In case Juja Road Substation the specs were initially wrongly designed by KPLC)</b></p>
EFFICIENCY	<p>6. <b>Efficiency of Resource Transformation into intended Results, including Value for Money and corruption:</b> Available resources were budget, technology, know-how, and labor, the results can be catalogued as highly efficient (including turn-key modality). No corruption issues were reported.</p>	<p>The turn-key modality of the Project was a key success factor for timely implementation, besides there was no report of any case of corruption.</p> <p>The project preparation took over 10 years, even after the economic conditions in Kenya became again favorable in the early 2000's. A long preparatory phase reduces the real context of the project as inflation, and market diversification affect the financial side; changes in technology, and expertise modify the scope of the project. Nevertheless, Finnish and Kenyan actors demonstrated professionalism and contributed individually to the success of the Project.</p>	<p><u>Project Monitoring instruments:</u> In absence of Logic Framework and Theory of Change tools, providing additional consultancy resources for proper identification of relevant stakeholders and calculation of indicators based on real operational data of the project are needed.</p> <p><u>Project Safeguards:</u> Assessment of Environment, Social, Poverty, and Resettlement aspects are key and mandatory in the Development Partner Community, including multilateral and bilateral cooperation. Contractor shall be coordinated by MFA/EOF.</p>
	<p>7. <b>Key Success Factors Affecting Project Implementation:</b> A successfully and timely implementation and commissioning. Bottlenecks included extremely long project preparation time, changes in budget, slow payments, and political unrest. The MFA, FINNVERA, and Nordea Bank in Finland, provided supported funding. The Embassy of Finland in Nairobi was the liaison among Finnish and Kenyan actors. Treasury, MOEP, KPLC in Kenya, supervised financial and technical aspects.</p> <p>8. <b>Environmental, Health &amp; Safety Standards, Environmental Management Plan:</b> The project proceeded accordingly.</p>		

	Findings	Conclusions	Recommendations
IMPACT	<p>9. <b>Improvement of Quality of Life of Beneficiaries and Economic Development and impact at different community and cross-cutting levels:</b> The Project has been contributing to the economic growth of beneficiaries’ (regular and marginalized) mainly commercial and micro-industrial businesses by substantially improving the reliability and efficiency of the power supply; eventually contributing to increase the quality of life and economic development of residential, commercial and industrial beneficiaries. The impact was positive at social-economic, and environmental context. The Project results eventually reached as well poor and vulnerable communities.</p>	<p>The Project operation has been facilitating reliable and additional electricity services to residential and other vulnerable customers, which can be translated into better quality and standards of life (refrigeration, lighting for education, and sanitation), to commercial and industrial customers which can be translated into better and stable business opportunities, eventually creating additional social and economic perspectives. Regarding public services, water, sanitation, health, and sewage have benefited as they are stable and reliable now. However, no human rights, or gender equality dimension identified during evaluation</p>	<p><u>Specific Roles of Stakeholders:</u> The MFA is recommended to have a consistent data base of the project documentation, where the project implementation process is recorded.</p> <p><b>Recommendation 2: Project Implementation and Administration Phase</b></p> <p>The MFA/EOF are recommended to conduct the first project review at implementation stage (mid-term review) to comply with LAF and TOC proceeds.</p>
SUSTAINABILITY	<p>10. <b>Sustainability through functional O&amp;M:</b> The Project is functioning and performing properly according to the book, thanks to the highly qualitative O&amp;M training provided by the EPC contractor.</p>	<p>The O&amp;M has shown to be efficient and effective, as the substation is providing stable and reliable electricity services as expected without interruptions</p>	

	Findings	Conclusions	Recommendations
COORDINATION, COMPLEMENTARY AND OTHER	11. <b>Relevance of other Cooperation Programs to the Project, development results, accountability, and consistency with other policy areas:</b> Consistency with the program for new connections funded by EIB and implemented by KPLC, which has allowed new users to enjoy power from the Project. Therefore, outcome and impact have materialized social and economic development results and consistency with other policy areas as national development of wealth and employment, energy, and climate. The impact on national debt is low.	As the Project has demonstrated consistency with development policies, national and from development partners, including demonstration of sound and consistent achievement of outputs, outcomes and impacts, it fulfils the conditions of harmonizing development of results, complementary, and coherence of the power sector. The results showed by the Project, including lessons learned, are the best guidance to be used as a relevant template for future engagements using Finnish technical cooperation for development resources, which is open to be combined with other inputs from the development partner community active in Kenya	
	12. <b>Relevance for future business opportunities:</b> The Project can be used as a template for further developments, as it is the case now of the preparation of the modernization of the Ruaraka Substation and the Lake Turkana wind park funded by Finnfund		

## 1. Introduction

### 1.1 Purpose of the evaluation

FCG Finnish Consulting Group (FCG) was commissioned by the Ministry for Foreign Affairs of Finland (MFA) to conduct an ex-post evaluation of a Concessional Credit Scheme (CCS) financed project in Kenya called the *Juja Road Substation Renewal in Kenya*.

**Foreword:** The Concessional Credit scheme (CCS) was one of the Finnish Government's financing instruments in development policy field until 2012, when it was discontinued. The CCS instrument was criticized for not focusing sufficiently on achieving development results, which contributed to the decision to discontinue the scheme, according to the Finnish Ministry of Foreign Affairs (MFA).

In 2016, the Government of Finland launched the Public Sector Investment Facility (PIF) instrument, which is based on the same legal framework as CCS, and has similar objectives in promoting economic and social development in developing countries by making use of the experience and technology of Finnish companies, which has been promoted by the Ministry of Foreign Affairs (MFA) of Finland.

As part of the decision to launch the PIF instrument, steps were taken to ensure a stronger focus on development results. One of these steps is to increase the number of end-of-project evaluations of PIF and CCS projects. The aim is to generate information on development results and lessons learned from the projects particularly to support programming and management of the PIF financial instrument.

The turn-key rehabilitation and upgrading of the "Juja Road Substation Renewal Project" at high voltage (HV) and medium voltage (MV) levels in Nairobi, Kenya ("The Project") was financed by a concessional credit line arranged through MFA of Finland.

The Project owner is Kenya Power Lightning Company (KPLC), which owns and operates the electricity distribution system, including managing electric metering, licensing, billing, emergency electricity service and customer relations in Kenya.

The project management was conducted by the contractor ABB Oy, Power Grids – Grid Integration in Vaasa, Finland (now called Hitachi-ABB).

Upgrading of Juja Road Substation was discussed between the KPLC and the Finnish project promoter (at the time, ABB Stromberg) already back in 1990's, but was put on hold due to changes in economic and policy context in Kenya. It continued again in 2004, with project feasibility study prepared in 2005 and appraised in 2007. The project start was delayed until 2014. The main reasons for the long interruption in the process were changes in the national government, including a high fluctuation in the management of the power utility (KPLC); and procurement regulations for the public sector.

The Project implementation milestones are summarized in Table 1, and the Project Engineering Procurement and Construction (EPC) companies are summarized in Table 2 as follows:

**Table 1: Project Implementation Milestones**

No.	Milestone	Effective Date
1	Effective start	30.12.2014
2	Access to site	04.02.2015
3	Installation completion	30.12.2016
4	Commissioning start	01.01.2017
5	Completion Certificate	25.06.2017 (Contractual: 31.07.2017)
6	Operational Acceptance Certificate	25.01.2018
7	Last shipment of Spare Parts received at site	14.12.2020

Source: Hitachi ABB Power Grids 2021

**Table 2: Project Engineering Procurement and Construction Companies**

No.	Name of Company	Offshore Supplier
1	ABB Oy, Power Grids, Grid Integration, Vaasa	Finland
2	ABB Oy, Power Grids, Grid Automation, Vaasa	Finland
3	ABB Oy, Power Grids, Transformers, Vaasa	Finland
4	ABB AB, ABB Cable accessories	Sweden
5	ABB s.r.o., Medium Voltage Products	Czech Republic
6	ABB AG, Power Grids, High Voltage Products	Germany
7	Reka Kaapeli Oy	Finland
8	Ruukki Construction Oy	Finland
9	Citec Oy, Vaasa	Finland
10	Escarmat Oy, Vaasa	Finland
11	Oy Ravera Ab, Vaasa	Finland
	<b>Name of Company</b>	<b>Onshore Supplier</b>
12	ABB Oy Site Organization in Nairobi	Kenya
13	ABB Kenya Ltd	Kenya
14	Kalibin Building Contractors Ltd	Kenya
15	Keran Ltd	Kenya
16	Steel Structures Ltd, Nairobi, Kenya	Kenya
17	Planoconsult, Nairobi, Kenya	Kenya

Source: Hitachi ABB Power Grids 2021

**Evaluation Purpose on a Wider Context:** The results of the evaluation provide the MFA with specific advice and lessons-learned to improve and to further develop the readiness of the PIF funding instrument; to provide an independent view of the effectiveness of the Finnish technical cooperation for development; and to generate information for the MFA on the outputs, outcomes, and impact of the CCS funded projects, including the sustainability of the results.

**Evaluation Purpose on the Power Sector Context:** The results of the evaluation provide insights and awareness on the relevance of power interventions programme as energy security is a key instrument to trigger social and economic growth, including the relevance to electricity services satisfying the needs of beneficiaries, while showing consistency with partner country's development policies, and with Finland's development policies.

**Evaluation Purpose on the Development Cooperation Context:** The evaluation has taken due account as well, of the Finnish visibility as an intrinsic element of each action funded by Finland, namely examination on policy for international development cooperation, know-how sharing, low carbon technologies, and other cross-cutting issues as i.e., gender, environment and climate change, rights-based approach, people with disabilities, among others have been integrated into the project identification, formulation, implementation, governance and monitoring.

## 1.2 Objectives and scope of the evaluation

The main overall objective of the ex-post evaluation of the Project is to provide an external, independent and objective assessment of the project.

The evaluation results are expected to help the MFA to understand:

- Whether the Project was implemented in an appropriate and efficient manner;
- How well the targets and goals laid out in the project plan have been achieved; and
- The level of sustainability of the Project results, including long-term development impacts of the Project.

The evaluation concept has been based on the standard OECD and DAC evaluation criteria<sup>1</sup> for development, which are (i) relevance; (ii) effectiveness; (iii) efficiency; (iv) impact; (v) sustainability; and (vi) coherence.

The evaluation scope covers the planning and implementation phases of the project and actions to ensure sustainability of results after the completion of the project. Overall, the evaluation will cover a timespan of roughly 17 years, starting from the project planning in 2005, until the present situation in 2022.

## 1.3 Evaluation methodology and approach

This evaluation combines a mix of methods for data collection and analysis, utilizing both primary and secondary data sources. Specifically:

**Desk Review of Secondary Data:** The evaluation team reviewed Project documents received from the MFA of Finland, the Finnish contractor Hitachi-ABB, the Finnish loan guarantee provider FINNVERA, as well as Kenyan and Finnish policy documents that are publicly available.

As a remark, the Project Feasibility Study (2005); the Project Appraisal Report (2007); the Hitachi-ABB Bidding Documents, and the Hitachi-ABB Juja Road Substation Presentation (2016) provided the most comprehensive set of information about the project, which greatly facilitated the process of interviews during the field visit in Kenya. The complete list of documents reviewed by the evaluation team is documented in Appendix 3.

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<sup>1</sup> OECD (Evaluation of Development Programmes, and DAC (Criteria for Evaluating Development Assistance). Accessed on September 4, 2022. <http://www.oecd.org/dac/evaluation/daccriteriaforevaluatingdevelopmentassistance.htm>.

After the Project Feasibility Study (2005) and Project Appraisal (2007) reports, there was a time gap of 8 and 6 years respectively, before the project was approved and the commercial contract was signed. During this time the scope of the project was modified from Air Insulated Switchgear (AIS) to a by far more compact Gas Insulated Switchgear (GIS) system. The change was of great advantage as KPLC could enjoy equipment of the latest technology on one side, and on the other hand allowed Hitachi-ABB to implement the renewal of the Juja Road substation in parallel without shutting down its operation which is a remarkable achievement.

**Primary Data Collection:** The evaluation team collected all relevant data with incumbent stakeholders through a video interview on 31 August 2022 with Hitachi-ABB, and during the field mission to Nairobi during 27-30 September 2022 through face-to-face interviews with KPLC. Key Informants included the representatives of the Finnish main EPC contractor Hitachi-ABB, representatives of KPLC (Acting Managing Director, and General Accountant), including the Juja Road Substation Operation Manager, in addition to representatives of the MFA of Finland, FINNVERA, the Embassy of Finland in Nairobi, and the European Investment Bank (EIB) representatives in Nairobi.

For primary data collection, the evaluation team created a structured questionnaire for collecting information first through interviews and discussions, and then complemented by asking the respondents to provide written responses to ensure that data is collected systematically. The written responses were duly submitted by Hitachi-ABB and KPLC.

Hitachi-ABB Finland: The evaluation team conducted a video interview with Hitachi-ABB Finland during the inception phase. Hitachi-ABB Finland, mentioned that the modular and compact nature of the GIS-based switchgear commissioned at the Juja Road Substation is unique in the sense that it allowed the parallel refurbishment to be carried out ‘under live conductors’, in other words without the need to close the Juja Road Substation.

Hitachi-ABB responded in written to the questionnaire provided to them by the evaluation team; in addition to share the following: a list of variations orders of equipment requested by KPLC during implementation; a copy of the Operation Acceptance Certificate (dated 8 February 2018); and the complete set of bidding documents which include a comprehensive technical description of the scope for renewal of Juja Road Substation, as follows: (i) Bid Form; (ii) Covering Letter Form; (iii) Notes and Clarifications Section (a comprehensive technical description of the Project scope); (iv) Price Schedules Form; (v) Time Schedule Form; (vi) Bid Security Form; (vii) Power of Attorney Template; (viii) Eligibility and Qualifications Form; (ix) Subcontractors Form.

KPLC Kenya: In addition to the interviews with personnel of KPLC during the field mission, the evaluation team received from KPLC the filled evaluation matrix; technical schematics of the Juja Road Substation (before and after the project); and the certificates of acceptance and operation.

During the field visit to Juja Road Substation, the team did observations and inspections of the administrative building facilities; Control and Dispatch Centre (which manages power generation at national level); the new Gas Insulated switchgear (GIS) facilities at 132 kV and 66 kV levels; switchgear units at 11 kV; Supervisory Control and Data Acquisition (SCADA) and communications centre; and outdoor main power transformers (5 units). Observations during the field visit were recorded through photos, which have been solely used for evaluation purposes only. The list of stakeholders consulted during the inception phase and field visit is provided in Appendix 4 and the questionnaire in Appendix 5.



**Data Analysis:** The assessment of the effectiveness and efficiency of the project, to what extent the project reached its objectives with the resources available to it, is usually measured against a Logical Framework or Results Framework. However, during the previous CCS instrument, such tools were not required. The recommendation to apply Results Framework (Logical Framework) was introduced in the new PIF instrument from 2016 onwards. Hence, the evaluation team has re-constructed a Results Framework/Logical Framework for the project, including high-level performance Indicators for project long term goal (impact), medium term objective (outcome), and short-term achievements (outputs), which have been utilized to evaluate to what extent the project achieved these. The draft reconstructed Results Framework is provided in Appendix 6.

**Reporting on the Evaluation:** Is composed by three phases as follows:

**Deliverable 1:** Inception report, presenting the initial findings from desk review, detailed evaluation questions and methods for data collection in the project area in Kenya. The Inception Report was accepted and approved by the MFA;

**Deliverable 2:** Draft evaluation report, presenting evaluation findings, conclusions and recommendations for review of MFA; and

**Deliverable 3:** Final evaluation report approved by MFA.

#### 1.4 Limitations, risks and mitigation measures

During the field mission, the evaluation team encounter lack of effective support from KPLC management, as only one interview was confirmed on a short notice only when the evaluation team's international energy expert arrived to Nairobi and visited KPLC. Much needed project documents; and key data, like supply and demand load, power generation, and power outages profiles were in principle promised to be shared, but eventually partially submitted, even after several follows. Such limitations are not uncommon in ex-post evaluations of this type, and it highlights the importance of collecting and reporting data on project impact indicators when the project is being implemented and there is clear rationale for sharing such data.

As a mitigation measure to filling-up the gaps and complete the evaluation exercise, compatible alternative sources of data, and other valid standard references like industrial good practices and interpolation have been used, including the data gathered during the interviews as the evaluation team could still talk with the same key personnel at KPLC in Nairobi, and at Hitachi-ABB in Finland who managed the implementation of the renewal of the Juja Road Substation.

## 2. Description of the Context and the Evaluated Project

### 2.1 Project context

**The Global Power Sector Context:** The Government of Kenya (GOK) recognizing that energy services are a critical input into economic activity and an important contributor to employment and fiscal revenues, has made efforts to secure sustainable supply of electricity services as a key to reach the objectives of its Economic Recovery Strategy for Wealth and Employment Creation (ERSWEC, March 2004). Since then, the

ERSWEC has been emphasizing accelerated economic growth, employment creation, increased productivity across all sectors, provision of basic needs, and equitable distribution of national income.

Hence, the GOK engaging in a long-term vision and policy framework reform process, has improved operational efficiency and effectiveness of the power sector. For the last few decades, the main chronic issues affecting the power sector have been a weak legal and regulatory framework<sup>2</sup>. On the global power sector context, the Renewal of the Juja Road Substation is consistent as the GOK acknowledges the importance of the energy sector and presents it as one of the priorities in the economic recovery under the following objective: *"to ensure adequate supply of affordable energy to stimulate economic growth"*.

Traditionally, the power generation has been dominated by the public Kenya Electricity Generating Company (Kengen); while the transmission network once owned and operated by the Kenya Power and Lighting Company (KPLC), was transferred to the Kenya Electricity Transmission Company Limited (KETRACO) created in 2007. KPLC was (and still is) the sole licensed bulk power purchaser and distributor. The legal framework for the power sector, back in 2004 when the renewal of the Juja Road Substation was designed, was mainly guided by the Electric Power Act (EPA) 1997, which governed the generation, transmission and distribution (T&D) of electricity. The EPA provided guidelines to manage and administer the funding of the Rural Electrification Program (REP) as well, and provided regulation of the power sector through an autonomous body, the Electricity Regulatory Board (ERB), which later on in 2007 was replaced by the Energy Regulatory Commission (ERC)<sup>3</sup>. Summarizing, the spirit and scope of the Project is aligned with the above.

**Applicable Environmental and Social Laws:** The project was required to meet the conditions specified under EMCA 1999. In addition, the following legal requirements applied to the project: Physical Planning Act, 1996, Local Government Act (Rev. 1998), Public Health Act (Cap. 242), Energy Act of 2006, The Standards Act Cap 496, Land Planning Act (Cap. 303), Water Act, 2002, Penal Code Act (Cap.63), The Traffic Act Chapter 295 Laws of Kenya, The Public Roads and Roads of Access Act (Cap 22 Laws of Kenya), The Agriculture Act, Cap 318 of 1980 (revised 1986), Antiquities and Monuments Act, 1983 (Cap 215), Occupational Safety and Health Act, 2007, Work Injury and Benefits Act, 2007, Occupiers Liability Act (Cap. 34), The Registration of Titles Act Cap 281, and The Radiation Protection Act (Cap 243 Laws of Kenya).

## 2.2 Scope and overview of the Evaluated Project

**Background:** The Juja Substation was built by the British colonial government and commissioned in 1958 to distribute power to the city of Nairobi, with the power being evacuated 700 km upstream from Owen Falls large hydropower (HP) facility at Jinja, Uganda. At the time in colonized Kenya there were only isolated power

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<sup>2</sup> The World Bank (2004). Kenya-Energy Sector Recovery Project (English). Washington, D.C. : World Bank Group. <https://documents.worldbank.org/curated/en/231491468753301505/Kenya-Energy-Sector-Recovery-Project>

<sup>3</sup> The World Bank (2004). Kenya-Energy Sector Recovery Project (English). Washington, D.C. : World Bank Group. <https://documents.worldbank.org/curated/en/231491468753301505/Kenya-Energy-Sector-Recovery-Project>

Godinho, Catrina; Eberhard, Anton. 2019. Learning from Power Sector Reform Experiences : The Case of Kenya. Policy Research Working Paper;No. 8819. World Bank, Washington, DC. World Bank. <https://openknowledge.worldbank.org/handle/10986/31561>  
License: CC BY 3.0 IGO.

plants, mostly powered by diesel generators, present in the cities of Nairobi and Mombasa, with a few in the then White Highlands. The need for additional capacity and stable power supply resulted in the construction of a 132 kV double circuit line from Owen Falls Power Station ending at Juja Road Sub-Station, which was a massive undertaking by the standards of that time. The original set of five power transformers had a total of 255 MVA, arranged in a banked way. The distribution lines were connected to 66 kV distribution feeders to supply the city, with the majority of this being done through the 66/11kV Parklands Sub-Station.

Over the years, development of the country's main HP system (the Seven Forks Scheme) continued, but with also the operation of diesel power stations in many parts of the country. New 132 kV lines were constructed to the country's second city, Mombasa, and a single line north to Kindaruma.

By 1980s, on the back of rapid economic development and due to massive expansion of power supply to households in the country, there was a lot of pressure on the country's electricity system. By the year 2000, the infrastructure of the Juja Substation was obsolete in addition to bulky, requiring huge effort and cost for operation and maintenance (O&M), which eventually became a patchwork of ad-hoc activities.

As a result, in 1988, initial discussions began on upgrading the substation. Feasibility studies were undertaken, and bilateral discussions between Kenya and Finland continued and resulted in a memorandum of understanding between Finland's Ministry of Foreign Affairs and GOK, leading to a financial commitment. Due to political circumstances in much of the 1990s (clamour for multiparty democracy in Kenya) and the attendant isolation of the Kenyan regime by foreign governments, the project did not make much headway in this decade. However, the regime gave way in 2002 and by January 2003, a new government, popularly elected, was formed. In the same year, the project was revived, and technical specifications were developed. Lending agreements were developed with NORDEA bank, and a loan guarantee was approved.

The project was financed by way of two financing mechanisms: a loan of Euros 20 million (NORDEA bank) and a grant of Euros 4 million (from the MFA, Finland). The loan was guaranteed through FINNVERA bank and by 2013 the project was approved. In 2014 the project implementation kicked off.

**Project Deliverables:** The Juja Road Substation<sup>4</sup> was refurbished and modernized between 2014-2018 with a full new set of electromechanical and power control systems, complete new set of power integration systems with the T&D network, and brand-new civil infrastructure, including administrative and communication facilities. Key products included high voltage (HV) and medium voltage (MV) switchgear, power transformers, and ABB's IEC 61850-compliant open automation, control, protection and communication systems, enabling local and remote monitoring and control from Kenya Power's national control center.

The capacity of the old Juja Road Substation was eventually increased from 255MVA to 360 MVA (2 new x 90 MVA, and 3 x 60 MVA power transformers as described below). The fully modernized Juja Substation was commissioned in 2017, and on 8 February 2018 KPLC granted the acceptance operation certificate to the main contractor of the Project Hitachi-ABB Finland. According to the main contractor, the following equipment, services and training were included into the scope of supply:

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<sup>4</sup> Hitachi-ABB Power Grids Finland (2021). Juja Road and Ruaraka Project Presentation to the MFA 1.10.2021. Slide 8 and 9.

- i. Supply and installation of Gas Insulated Switchgear (GIS) for 132 kV and 66 kV voltage levels and 11 kV switchgear (SWG);

**Table 3: List of Modernized 132 kV Feeders**

No.	132 kV Feeders	Function
1	Dandora 1	Import
2	Dandora 2	Import
3	Rabai	Import
4	Kindaruma	Import
5	Lessos 1	Export
6	Lessos 2	Export

**Table 4: List of Modernized 66 kV Feeders**

No.	66 kV Feeders	Function
1	Athi	Export
2	Nairobi South 1	Import
3	Nairobi South 2	Import
4	Nairobi South 3	Import
5	Jivanjee 1	Export
6	Jivanjee 2	Export
7	Emco	Export
8	Parklands1	Export
9	Parklands 2	Export
10	Ruaraka 1	N/A
11	Ruaraka 2	Export
12	Tana 1	Export
13	Tana 2	Export

- ii. Design, delivery, installation and commissioning of two (2) new 90 MVA transformers, related components and connections;
- iii. Adaptation of three (3) existing 60 MVA transformers;
- iv. Decommissioning four (4) old transformers (3 x 15 MVA, and 1 x 30 MVA);
- v. A new control building to house the new equipment (GIS's, SWG, LV, DC, Control and Protection Panels and Substation Control System);
- vi. Design, delivery, installation and commissioning of the 132 kV GIS, related components and connections, and decommissioning the unnecessary old ones;
- vii. Design, delivery, installation and commissioning of the 66 kV GIS, related components and connections, and decommissioning of the unnecessary old ones;
- viii. Design, delivery, installation and commissioning of the 11 kV SWG, related components and connections, and decommissioning of the unnecessary old ones;
- ix. Complete KPLC maintenance team factory trainings for the GIS-SWG, SCADA, protection relays, telecommunication and relay test equipment;
- x. Complete set of the spare parts for all main equipment and devices;
- xi. Project Management.

### 2.3 Key stakeholders and their roles

The following Table 5 summarizes the key stakeholders of the Renewal of the Juja Road Substation and their functions. Details were collected at inception phase and during the interviews at KPLC.

The institutional websites of the incumbent stakeholders have been consulted as well.

**Table 5: Key Stakeholders and their Roles**

Stakeholder	Roles
<b>International Level: Finland</b>	
Ministry for Foreign Affairs (MFA)	<p>Project approving agency in Finland. Provides funding for the interest subsidy and grant portion (of the total concessional credit amount) from the Government of Finland ODA funds.</p> <p>Responsible for supervising that the concessional credit is used for the purpose determined in the funding decision. Requests Supplier to provide semi-annual procedure reports on the Project.</p>
Embassy of Finland in Nairobi, Kenya	Under the guidance of the MFA worked together with The National Treasury and Planning office, and the MOEP for facilitating the process of project implementation, mainly mediating the financial management. Contributed in addition to support the Project monitoring.
FINNVERA	Provides the Buyer Credit Guarantee to the Guarantee Holder. The Concessional Credit Scheme (CCS) requires that the Finnish content (materials and equipment of Finnish origin) to be at least 30%-50%, and the supplier to be a Finnish company.
Lending bank: Nordea Bank	<p>Contract party to the loan granted to the borrower (The National Treasury and Planning office).</p> <p>Responsible for processing the payments (after receiving payment request from KPLC) of the Grant and Credit portions of the fund to the Supplier, under the terms agreed in the commercial contract, upon request by Borrower.</p>
Finnish contractors: Hitachi-ABB	<p>Hitachi-ABB, the lead engineering, procurement and construction (EPC) contractor was responsible for all works; and technical and management services related to the turn-key Juja Road Substation Renewal Project, including overall supervision and control of local contractors and service providers; training program to KPLC personnel; and long term service agreement for O&amp;M (know-how transfer).</p> <p>The Contract Agreement with KPLC included all technical specifications and schedules (employer's requirements including environmental management plan); commercial documents; bill of quantities; technical and financial guarantee documents; full project documentation "as build"; and Final Certification of Acceptance.</p>
<b>National Level: Kenya</b>	

<p>The National Treasury and Planning<sup>5</sup>.</p>	<p>” Treasury” leads the planning and management of economics and public finance. In addition to formulation, implementation and monitoring of economic, financial and development policies.</p> <p>Treasury has the following relevant core functions: (i) to formulate, implement and monitor macro-economic policies for expenditure and revenue; (ii) manage level and composition of national public debt, national guarantees and other financial obligations of national government; (iii) to mobilize domestic and external resources for financing national and county government budgetary requirements; and (iv) all aspects related to the national budget. Treasury is the formal borrower for CCS Projects, eventually responsible for management and repayment of foreign debt.</p>
<p>Ministry of Energy and Petroleum (MOEP)<sup>6</sup>.</p>	<p>Manages the energy and power sector, generating policies designed to create an enabling environment for its efficient operation and growth, including provision of sector related strategic directions and a long term vision.</p> <p>The associated sector institutions are the MOEP; Energy and Petroleum Regulatory Authority (EPRA); Kenya Pipeline Company (KPC); 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); National Oil Corporation of Kenya (NOCK); Kenya Petroleum Refineries Limited; independent power producers (IPPs); and beneficiaries/ customers.</p> <p>The MOEP has five Directorates: (i) Petroleum Energy; (ii) Geo-Exploration; (iii) Renewable Energy; (iv) Electrical Power; and (v) General Administration and Support Services.</p>
<p>Kenya Power and Lighting Company (KPLC)<sup>7</sup>.</p>	<p>The KPLC is a national electric utility company, managing electrical power T&amp;D, electric metering, licensing, billing, emergency electricity service and customer relations. KPLC owns and operates most of the electricity T&amp;D system in the country. KPLC is a limited liability company which transmits, distributes and retails electricity to customers throughout Kenya. The GOK has a controlling stake at 50.1% of shareholding with private investors at 49.9%. KPLC is listed on the Nairobi Securities Exchange (NSE). The company was in 2008 awarded the ISO 9001:2008 certificate for standardization. Kenya Power headquarters are at Stima Plaza, Kolobot Road in Parklands, Nairobi. KPLC leads the national planning for electricity generation and administers the T&amp;D capacity to meet demand, which includes building and maintaining the power T&amp;D network. It controls the retail of electricity service to all consumers as well.</p>

<sup>5</sup> The National Treasury and Planning. <https://www.treasury.go.ke/>

<sup>6</sup> Ministry of Energy and Petroleum. <https://www.kpc.co.ke/moep/>

<sup>7</sup> Kenya Power and Lighting Company. <https://www.kplc.co.ke/>

National Environment Management Authority (NEMA) <sup>8</sup> .	NEMA was established under the Environmental Management and Coordination Act (EMCA) No. 8 of 1999, as the principal instrument of government in the implementation of all policies relating to the environment. NEMA grants environmental licenses for power generation, T&D. NEMA provided the environmental license for the Project.
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## 2.4 Results Framework reconstruction

The initial design and other relevant related documentation of the Juja Road Substation Renewal did not include any Results Framework nor a reference to it.

Neither did the Project planning specifically outline any Results Framework targeting impacts, outcomes and outputs, rather the Project reports focused on the status of physical results of works and services in connection with financial management.

The rationale of placing a Results Framework within the planning, together with benchmarks and key performance indicators (KPIs), is to provide an effective project management tool for consistently follow-up progress towards reaching the different levels of objectives (outcomes and impacts) beyond completing only works and services of the planned physical project components (outputs). The project design is also silent about the “Theory of Change”, which is a methodology or a criteria for planning, participation, adaptive management, and evaluation.

At this point (ex-post evaluation) it is not feasible to exactly reconstruct the logic of the intervention, in addition the evaluation team has noted that the project planning and preparation process, including definition of scope, until kick-start and final commissioning took a very long time from 2004 to 2018.

The reconstruction of the Results Framework in Table 6 has been prepared based on the description of the Project outputs in the different planning documents, while interpolating objectives and outcomes taken from power sector development goals. As the indicators were not clearly set in the planning phase there is no clear baseline and end line data available either.

Summarizing, the immediate objective of the Project was to stabilize and secure the power supply situation back in 2004 by modernizing the old Juja Road Substation at 132/66/11 kV levels, including operational capacity expansion of the Substation from 255 MVA to 360 MVA.

The long-term objectives of the Project were and have been to achieve stable and secure power T&D, reduce or eliminate load shedding and black-outs, achieve loss reduction (commercial and non-commercial), improve the quality of supply of electricity services, and increase the number of new connections by improving the quantity of collection of revenues (more clients served with additional electricity services). Eventually these contribute to the social and economic growth of Kenya.

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<sup>8</sup> National Environment Management Authority. <https://portal.nema.go.ke/>

The sustainability of the investment has been supported by the excellent capacity building component provided by Hitachi-ABB for training managers and operators of the Juja Road Substation in the operation and servicing of the new and modern commissioned GIS technology, machinery, and additional support equipment.

In conclusion, the operation of modern and reliable power infrastructure supported by a solid capacity development component should be considered as main output triggering the fulfilment of the reconstructed outcome, and impact reflected in the Results Framework.



**Table 6: Reconstructed Results Framework of the Juja Road Substation Renewal Project**

Results	Indicators	Baseline	Target	Means of verification	Assumptions
<b>Identified Impact</b> Contribution of the power sector to the national development goals achieved	Social, economic, environment, and climate aspects improved (health, sanitation, education) [Unit: Numbers]; New and additional employment created [Unit: Numbers]; Residential, commercial, industrial clients increased [Unit: Numbers]; Additional revenues collected [Unit: Euro equivalent per year]; National climate targets supported [Unit: tones of GHG equivalent per year]	None: No initial numbers as starting points available	None: No target numbers calculated	National statistics	Consistent and long-term national development goals; Consistent and long-term power sector governance; Power sector initiatives from development partners
<b>Identified Outcome</b> Reliable, stable, and secure Electricity Services delivered by Juja Road Substation	<u>Juja Road Substation (new):</u> Additional power capacity from 255 MVA to 360 MVA increased [Unit: MVA]; New power infrastructure delivering uninterrupted electricity services at 132/66/11 kV fully operational [Unit: kWh]	<u>Juja Road Substation (old):</u> Old operational statistical numbers as starting points	<u>Juja Road Substation (new):</u> None: No target numbers calculated	KPLC annual reports KPLC statistics; Reports from Development Partners,	Continuous training; Efficient and effective O&M; O&M budget available
<b>Identified Outputs</b> Juja Road Substation Renewed: Turn-Key modernized and refurbished at 132/66/11 kV levels fully operational	Juja Road Substation delivering stable and reliable electricity services [Unit: kWh per year]	Old inventory and bill of quantities	New inventory and bill of quantities	Approved technical designs; As build project documents available	Stable and professional project management capacity
<b>Activities</b>					
Funding	Estimated budget approved [Unit: Euro equivalent]; Concessional loan, and grant approved	Initial budget calculated	None: No final budget targeted	Set of signed legal documents	Development policy Finland; Adequate sector governance framework in Kenya; Political willingness Kenya

Engineering- permitting	Design approved Permits granted	None:	None:	Set of approved documents	Selection committee with high technical capability
Procurement	Procurement documents approved-published; EPC selected and fielded.	None:	None:	Set of signed legal documents	Transparent process
Works and Services	Project documents approved; Power infrastructure implemented; Power infrastructure commissioned	Final inventory of old infrastructure	Final inventory of new infrastructure	Final certificate of acceptance	Institutional support Regular and smooth payment of financial obligations
Sustainability	Capacity development program conducted; Final O&M program approved	None: No initial Nr. of selected participants available	None: No final Nr. of trained participants expected.	List of trainees; Training syllabus	Stability of owner's personnel

Source: Energy Expert Estimates based on Public-Available Data

#### Narrative<sup>9</sup>:

- One-impact statement: Ultimate long-term benefits for target beneficiaries with indicators able to measure long-term impacts of the intervention
- One-outcome statement: Changes the project intends to accomplish by the end of the project implementation with indicators able to measure concrete changes resulted from the intervention in quantitative and/or qualitative terms
- Set of outputs: Tangible and intangible works and services delivered by the project with indicators able to define quality and quantity of deliverables of the intervention.
- Baseline: Initial starting indicators As the Results Framework has been ex-post reconstructed the original baseline is unknown
- Target: Final indicators to be achieved. As the Results Framework has been ex-post reconstructed the original targets are unknown

<sup>9</sup> Ministry of Foreign Affairs, Finland. <https://um.fi/evaluation-of-development-cooperation>

**Sustainability of the Project Outcome**<sup>10</sup>: Supplying the country with reliable, stable and secure electricity services, has been remarkable through the renewal of the Juja Road Substation. To strengthening the above, Juja Road Substation hosts the National Control Centre (NCC), which supervises and administers the entire Kenyan power grid, in addition to having a special in-situ team based there working 24/7 to ensure a smooth operation.

In addition to the indicators summarized in Table 6, the following detailed additional indicators influencing the success of the project Outcome should be mentioned:

- Stabilizing the national power system to a large degree, through better quality connection to the greater Nairobi kV interconnector system and ability to have switchable open points
- Operational flexibility of the system, contributing to better end-user customer service and experience (no interruptions to service, unlike in the past)
- Improving delivery of power to 50% of the city of Nairobi, which is estimated to contribute about 30% of Kenya's gross domestic product (GDP), estimated in US\$109 billion.
- Safety management protocols for KPLC, which meant that the project was delivered 100% accident free for both OHS and EHS parameters (during construction and since commissioning)
- Greatly contributing to a safer working environment for the company's staff
- Minimized O&M costs to a very large degree, with only the change of auxiliary relays reported over the last five years, and major inspection work on the GIS to be conducted only in the year 2037
- Capacity enhancement of KPLC staff, with 8 engineers sent to study in Europe and familiarize themselves with international protocols in power transmission and management (factory acceptance tests, etc.)
- KPLC is using project management systems and templates that were acquired from their Finnish counterparts during the construction phase, which is now scaled out for the entire power system

**Sustainability of the Project Impact**: Adding more detail to the indicators summarized in Table 6, the contribution of the power sector to achieve the national development goals has been demonstrated through key indicators as having a cost effective and robust power infrastructure (reliable supply of electricity services at a lower cost), less deforestation (less use of wood as a fuel source), increased access to modern forms of energy (renewable energy technologies, green hydrogen, waste to energy), regional equity (create nationwide economic prosperity, environmental soundness, and social equity), effective regulatory framework (a reformed power sector governance allowing scaling-up of renewables, energy efficiency and conservation), and accountability (a transparent and responsive sector towards wellbeing of society)<sup>11</sup>.

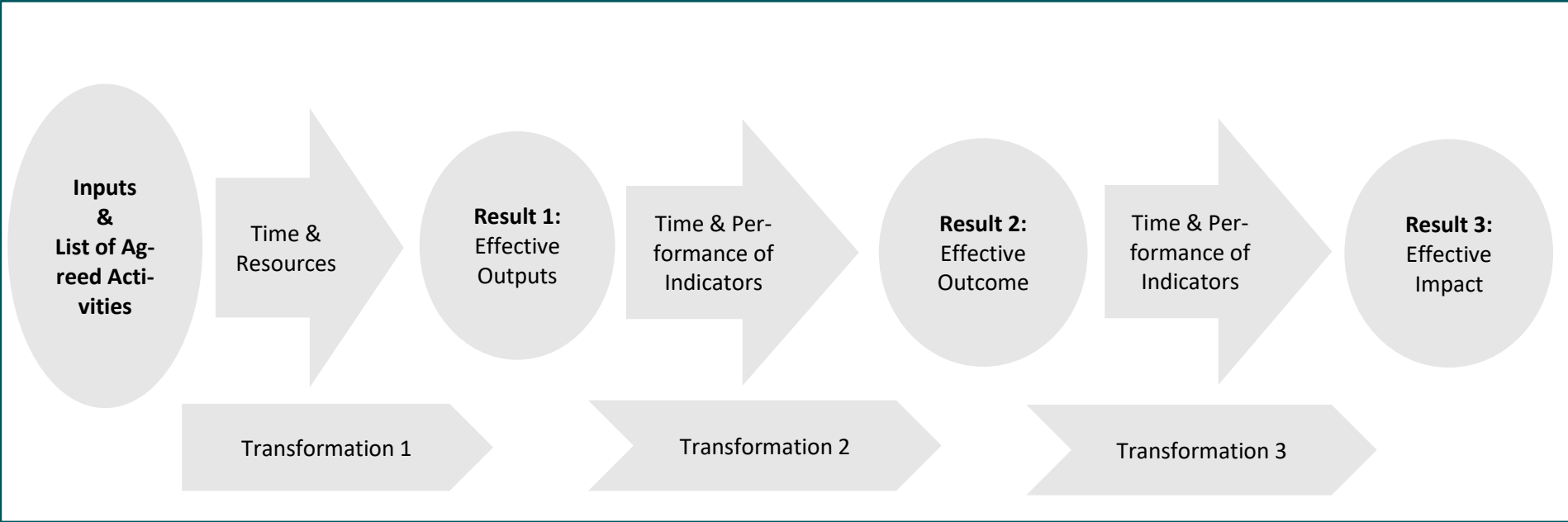
In conclusion, the operation of the modernized Juja Road Substation has contributed with the social and economic development endeavors of the GOK. Figure 1 summarizes the concatenation of results.

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<sup>10</sup> Interviews conducted at KPLC during field mission to Nairobi (26-30 September 2022).

<sup>11</sup> Ministry of Foreign Affairs Finland (2007). Juja Road Substation Renewal Project. Appraisal Report. Chapter 2.4 and 2.5

Figure 1: Summary Chain of Results of the Results Framework



Source: Energy Expert Estimates based on Public-Available Data

### 3. Findings

#### 3.1 Relevance

*Evaluation question 1: Was the project relevant to provide electricity services in the Nairobi area and the local populations that were to benefit from the project?*

##### **Finding 1: Benefit of Electricity services**

The Project has been having a key relevance in improving electricity services in the Nairobi area and beyond at national level, in addition to benefit with stable, secure and reliable power supply to residential commercial, and industrial consumers. Thus, the Project has demonstrated a most relevant contribution to provide modern and efficient electricity services<sup>12</sup>.

When the Project Feasibility and Appraisal were drafted in 2005<sup>13</sup>, and 2007<sup>14</sup> respectively, the Juja Road Substation was already the most important source of power for the 66 kV sub-transmission network in the Nairobi area and its surroundings, supplying power not only to commercial and industrial customers, but also to extreme poor communities like the Mathare Valley, Kibera, Mukuru and other slums around Nairobi city. Feeders from the 66/11 kV primary substations fed from Juja Road Substation extended into the greater Nairobi area in Kiambu, Thika, Muranga, Maragwa, Machakos, Kajiado and parts of Narok, Nakuru and Nyandarwa, supplying power to an area where over 30% of the total population of Kenya lived.

According to KPLC, the project has improved the delivery of power to an estimate of 50% of the city of Nairobi (the city is estimated to account for about 30% of the country's US\$109 billion GDP), therefore it is clear that local populations have highly benefited from the Project.

*Evaluation question 2: Did the project contribute to Kenyan developmental goals? Was the project in line with Finland's development policy objectives and global development goals?*

##### **Finding 2: Kenyan Development Goals**

The GOK recognizes that achieving national development goals can be materialized if electricity services with good quality are made available in sustainable, cost-effective and affordable manner to all relevant sectors of the economy. The GOK<sup>15</sup> published in June 2003 the Economic Recovery Strategy Paper (ERSP) as an orientation document to guide the major reforms to be undertaken over the period 2003 – 2007. In lieu of the same, and as a governance background, the GOK published the Sessional Paper No. 4 of 2004 on Energy, the National Energy Policy (NEP)<sup>16</sup> which enumerates key power sector challenges relevant to the Juja Road Project. The Project Appraisal report (2007)<sup>17</sup> states as well that the Project had a high priority in the national and provincial development plans and it was well aligned with the national and provincial policies.

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<sup>12</sup> Interviews conducted at KPLC during field mission to Nairobi (26-30 September 2022).

<sup>13</sup> Aberdare Engineering Limited (2005). Juja Road Substation Renewal Project. Feasibility Study. Chapter 1.0

<sup>14</sup> Ministry of Foreign Affairs Finland (2007). Juja Road Substation Renewal Project. Appraisal Report. Chapter 2.1.2

<sup>15</sup> Aberdare Engineering Limited (2005). Juja Road Substation Renewal Project. Feasibility Study. Chapter 2.

<sup>16</sup> Government of Kenya. 2004. Sessional Paper No. 4 of 2004 on Energy. Published by the Ministry of Energy. Retrieved from: <https://repository.kippra.or.ke/handle/123456789/1371>

<sup>17</sup> Ministry of Foreign Affairs Finland (2007). Juja Road Substation Renewal Project. Appraisal Report. Chapter 2.4

Expanding and modernizing the Juja Road Substation is consistent with the GOK's ERSWEC (2004) strategy and its efforts to reduce economic poverty by enhancing the quality and efficiency of electricity services. Hence, the Project supports the NEP's 2004 endeavor to developing and modernizing of its much-needed power infrastructure, backing-up the reforms to creating a modern electricity market.

The major challenges faced at that time were, (i) a weak power T&D infrastructure due to limited investment in power system upgrading; (ii) large power system losses estimated at 20% of net generation; (iii) extreme voltage fluctuations and intermittent power outages which cause equipment and material damage including losses in production; and (iv) low penetration or access of electricity at 15% of the total population (4% in rural areas).

The modernized Juja Road Substation has demonstrated that since its commission in 2018 has directly contributed to securing the supply of electricity, *"as load shedding has disappeared and the T&D system enjoys great stability"* (quoting from the interview conducted at KPLC during field mission). Thus beneficiaries (residential, commercial and industrial) have access to secure and reliable electricity services contributing to development and expansion of commercial ventures<sup>18</sup>.

### **Finding 3: Finland's Development Policy objectives and Global Development Goals**

The renewal of the Juja Road Substation, quoting the Appraisal Report (2007)<sup>19</sup>, and the interviews conducted during field mission<sup>20</sup>, confirmed the alignment of the Project with reliable power supply contributing to national development objectives and policies. The modernized substation since its commissioning has been supplying power not only to regular urban residential, commercial and industrial areas of Nairobi, but also to extremely poor communities (slums) and peripheric areas around Nairobi City, such as Mathare Valley, Kibera, Mukuru and others, which were then and are now at the focus of the Finnish development policy.

As reference, Finland's global development cooperation policy aims<sup>21</sup> to strengthen private investments, technology and innovations specially focusing in African less developed countries for achieving sustainable development goal (SDG) No. 1, *"end of poverty in all its forms by 2030"*. Poverty alleviation through increasing access to modern electricity services, supporting environmental sustainability and climate change mitigation, and promoting cleaner and efficient power distribution systems. After the desk assessment during inception phase, and the interviews with KPLC and the Embassy of Finland in Nairobi, it can be stated that the project has complied with its main impact to *"ensuring adequate supply of affordable energy to stimulate economic growth"*, as stipulated in the NEP (2004)

As a precondition for FINNVERA to allow funding through a CCS instrument to promote Finnish exports, the Finnish content of the credit should have between 30%-50% of works and services of Finnish origin exported by a Finnish company. In the case of Juja Road project, the Finnish content was estimated to be around 51%, including the value of material and services, financing costs and project margin, clearly fulfilling the award criteria. The project is a good example of a 'win-win' project, where Finnish financing is benefitting both the beneficiaries of the target country as well as Finnish private sector operators.

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<sup>18</sup> Interviews conducted at KPLC during field mission to Nairobi (26-30 September 2022).

<sup>19</sup> Ministry of Foreign Affairs Finland (2007). Juja Road Substation Renewal Project. Appraisal Report. Chapter 1.3 and 12.1

<sup>20</sup> Interviews conducted at KPLC and European Investment Bank during field mission to Nairobi (26-30 September 2022).

<sup>21</sup> Ministry for Foreign Affairs of Finland (2022). <https://um.fi/goals-and-principles-of-finland-s-development-policy>

*Evaluation question 3: How did the project contribute to Kenya's climate change mitigation and adaptation goals? What was its contribution to Finland's development policy goals related to climate change mitigation and adaptation?*

#### **Finding 4: Kenya's Climate Change Mitigation and Adaptation Goals**

Kenya's climate change governance<sup>22</sup>, the National Climate Change Policy Framework provide guidance for low-carbon and climate resilient development focusing on adaptation; afforestation and reforestation; climate-smart agriculture and drought management; and clean energy, and energy efficiency. To materialize climate governance, the Climate Change Act (2016) requested the GOK to develop action plans to guide and execute climate change mainstreaming into sector activities, having the energy sector as the most relevant target, while Kenya's five-year National Climate Change Action Plan (NCCAP) 2018-2022 provides guidelines for climate change adaptation and reduction of greenhouse gas (GHG) emissions.

To measure climate related goals and targets, Kenya's Nationally Determined Contribution (NDC), which builds on the National Climate Change Action Plan, Kenya pledges to reduce GHG emissions by 30%. As a result, Kenya has long been a continental leader in renewable energy use for electricity production, with the use of hydropower dating back a century.

In summary, the Project contributed to Kenya's climate priorities (SDG 13, climate action), by using energy efficient technologies, covering more users, therefore avoiding use of wood as fuel; and by providing resilient T&D infrastructure to connect to additional clean energy sources, all together helping the country to achieve its NDC.

#### **Finding 5: Finland's development policy goals related to climate change mitigation and adaptation**

It emphasizes on strengthening both, climate change adaptation and mitigation. Thus, promoting energy efficient power infrastructure copes with Finland's climate policy. In fact, the efficient power T&D nature of the Project technical design is aligned with Finland's development principles on climate mitigation policy.

#### *Additional finding on project relevance relating to terms of concessional credit financing*

According to OECD rules, projects qualifying for concessional credit financing must be either commercially non-viable, nor commercial financing available for investment. This condition is monitored by OECD and its partner countries through a "Notification Process", which mechanism includes a protesting period of 6 weeks.

Referring to the renewal of the Juja Road Substation project, the apparent commercial non-viability of the financing was questioned by OECD, arguing that investments in a power sub-station in the Nairobi area (capital city) are in principle considered to be commercially viable, in addition the Project was silent on explicitly mentioning to have specific pro-poor elements, such as targeting vulnerable

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<sup>22</sup> Government of Kenya. 2017. Sessional Paper No. 5 of 2016 on National Climate Change Framework Policy. Published by the Ministry of Environment and Forestry. Accessed on September 8, 2022, at <http://www.environment.go.ke/wp-content/uploads/2018/08/Climate-Change-Framework-PolicyMay2017.pdf>

Government of Kenya. 2020. National Climate Change Action Plan 2018 – 2022. Published by the Ministry of Environment and Forestry, Kenya. Accessed on September 7, 2022, at [http://www.environment.go.ke/wp-content/uploads/2020/03/NCCAP\\_2018-2022\\_ExecutiveSummary-Compressed-1.pdf](http://www.environment.go.ke/wp-content/uploads/2020/03/NCCAP_2018-2022_ExecutiveSummary-Compressed-1.pdf)

Government of Kenya. 2021. Kenya's Updated Nationally Determined Contribution (NDC) and JCM Activities. Communication from Ministry of Environment and Forestry to UNFCCC.

communities for providing access to energy, or considering additional social elements (lack of Results Framework) .

Eventually, the OECD accepted that the project fulfils the funding criteria mentioned above, as the overall financial situation in Kenya was difficult, and the concessional funding was non-objected. Another relevant aspect of the effectiveness of the concessional funding is that the Project was not included in the Energy Sector Investment Project funded by the World Bank, which covered power infrastructure.

### 3.2 Effectiveness

*Evaluation question 4: To what extent did the project achieve its immediate objective of significantly improving the supply of electric power to Nairobi area and surroundings, hence improving the services to local households and communities?*

#### **Finding 6: Significant Improvement of Supply of Electric Power to Beneficiaries**

**The Social Context of the Project:** The renewal of Juja Road Substation has resulted in having one of the largest GIS substations of its kind in eastern Africa, this would help assure adequate and reliable energy to Nairobi, which had a population of 4,397,073 in the 2019 census, while the metropolitan area has a population of 9,354,580. Approximately some 800,000 lived in the Juja area in 2013, as the project commenced. The Project triggered a significant improvement of power delivery to covering about 50% of the demand of Nairobi.

The Juja Road Substation became part of national grid control system, effectively supplying the 66/11 kV primary substations supplying the commercial and industrial parts of the city and areas inhabited by poor communities such as the Mathare Valley, Kibera, Makuri, and other slums around Nairobi city. Besides the 132 kV component of the substation supports the national high voltage (HV) interconnected system. The modernized Juja Road Substation has been stabilizing the national power T&D power system to a large degree, through resilient and qualitative equipment and better quality connection as i.e., the newly implemented ability to have switchable open points to distribute medium and high voltage according to the load demand. This operational flexibility or topology of the system, contributes to a versatile and customized end-user service resulting in an uninterrupted electricity service, unlike as in the past.

*Evaluation question 5: Did the project achieve the targeted increase in electricity supply? To what extent did the reliability of electricity supply improve? Did it contribute to increased electricity coverage (new power connections)?*

#### **Finding 7: Increased and Improved Reliability of Electricity Supply and New Additional Connections**

The capacity of the Juja Road Substation was increased from 255 MVA to 360 MVA after the refurbishment and renewal of the substation in 2018, which has helped to eliminate almost in 90% power outages, while increasing the capacity to serve additional customers<sup>23</sup>.

In addition, the scope of the Project included a deep and detailed knowledge-sharing program on management and O&M of the new GIS switchgear and peripheric service equipment<sup>24</sup>. From 2018 the commissioning year onwards, the sustainable supply of reliable, high quality, modern and secure electricity

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<sup>23</sup> Ministry of Foreign Affairs Finland (2007). Juja Road Substation Renewal Project. Appraisal Report. Chapter 8.1.2

<sup>24</sup> Hitachi-ABB Power Grids Finland (2021). Juja Road and Ruaraka Project Presentation to the MFA 1.10.2021. Slide 10



services has been significantly increased, and its reliability to supply electricity services is guaranteed by a sustainable and consistent O&M based in excellent industrial practices. The mentioned statements have been confirmed by KPLC during the field mission to Nairobi.

KPLC also confirmed that the additional capacity of the Substation could have triggered inclusion of existing illegal connections into the regular customer system, which technically can be considered as "new power connections", however no numbers nor any assessment has been conducted on that matter yet.

*Evaluation question 6: What were the key success factors or bottle necks that contributed to the project either achieving or falling short of its objectives? What was the role/contribution of the different actors (project owner, contactor and other stakeholders including the MFA)?*

#### **Finding 8: Key Success and Bottleneck Factors for Achieving or Falling Short Project Objectives**

As well-designed management and O&M training provided by the EPC contractor, has been recognized as the guarantor of the sustainable operation of the Substation so far. Further on, the supply of stable, reliable and modern electricity services to consumers. The highly qualitative supply of electricity services has been contributing to the Kenyan social, economic, environmental, and climate development goals, most of all SDG 1, "no poverty" and SDG 6, "energy for all".

Bottlenecks as such have not been identified during the evaluation process, as the Project is operating and delivering electricity services as planned.

#### **Finding 9: Role and Contributions of the Project Stakeholders towards Project Objectives**

- The MFA, FINNVERA, and Nordea Bank in Finland, provided support related with all financial and contractual aspects of the concessional loan, grant, and export credit guarantee.
- The Embassy of Finland in Nairobi facilitated the communication among Finnish and Kenyan actors for expediting different project implementation processes (Table 5).
- Hitachi-ABB, Finland, the lead Project EPC contractor and manager executed the implementation and commissioning the turn-key Project up to obtaining the final acceptance and operation certificates from KPLC the project owner. As commended by evaluation interviewees, Hitachi-ABB has its manufacturing line set-up in Finland and is proven to have strong technical capacities. At the time the project was implemented, it also had an office in Kenya, which took part in project implementation and liaison with authorities.
- The National Treasury and Planning, MOEP, KPLC in Kenya, provided support with all related supervision of all financial and technical aspects of the project. NEMA granted the environmental license for power T&D to the Project.

### **3.3 Efficiency**

*Evaluation question 7: How efficiently were available resources transformed into intended results in terms of quantity, quality and time? Can the project be deemed to have been good value for money?*

#### **Finding 10: Efficiency of Resource Transformation into intended Results, including Value for Money**

Available resources were budget funds, technology, know-how, and labor. Based on the desk assessment and results of the interviews on site, including information provided in the evaluation questionnaires, the results can be catalogued as highly efficient.

In terms of efficiency of technology (state of the art GIS-equipment, know-how and labor covering management and engineering), the renewal of the Juja Road Substation project was implemented as a turn-

key project, and supervised by the contractor Hitachi-ABB Finland, a leading manufacturing company in the power sector project-business. All related resources were efficiently mobilized with optimized timelines. The above was stated by KPLC on the written evaluation questionnaire.

In terms of efficiency of funding, the budget was well calculated, except for some additional unforeseen expenses occurred during implementation (video interview with Hitachi-ABB on 31 August 2022). The loan proceeds disbursed 18 payments over the project implementation period, however the last payment was delayed beyond the original contract period of validity in 2018, hence FINNVERA guarantee agreement was amended accordingly.

In conclusion it can be confirmed that the benefits and results obtained through the project implementation can be deemed to have been a very good value for money. As confirmed by FINNVERA, the loan repayments, which started already in 2015, have been proceeded in schedule, and the last repayments are due in 2025.

*Evaluation question 8: The project was implemented as a 'turn-key delivery'; how did this contract modality affect the effectiveness and efficiency?*

**Finding 11: Turn-Key Affecting Project Effectiveness and Efficiency**

The “turn-key” implementation modality of the Project made the contractor (Hitachi-ABB) responsible in front of KPLC for the functionality, the expected final, or ready to use result, and long-term operational performance of the modernized Juja Road Substation, as designing and executing are under the responsibility of the EPC contractor or supplier. In addition, the EPC company takes over the complete responsibility for following technical and contractual factors like bill of quantities, delivery dates, technical schedules, standardization, and commercial details of the Project as a single package up to final delivery to the customer. During the interviews, the Manager of the Juja Road Substation confirmed the above.

*Evaluation question 9: Appraisal report mentions that Kenya has had a bad record of corruption. Were there any anti-corruption measures taken in the project? Any good practices or lessons to learn?*

**Finding 12: Anti-corruption Issues, good Practices and Lessons Learned**

Supported by Development Partners, a Public Procurement and Disposal Act was enforced in January 2007, following calls for accountability in procurement by public departments. Previously the public procurement sector had operated without clear rules, thereby creating avenues for corruption. The Act, introduced strict rules, which increased the overall approval periods of the Juja Road Substation Project.

However, during inception phase, and later on during the face-to-face interviews in Nairobi, no corruption issues related to the Project execution have been reported. In addition, the procurement process followed technical, and budgetary as requested by the Finnish and Kenyan stakeholders, which can be considered as a good practice to follow.

*Evaluation question 10: What were the key success factors/bottle necks that contributed/constrained implementation (planning, procurement, implementation, risk management, monitoring, follow-up after close of project)? What was the role/contribution of the different actors?*

**Finding 13: Key Success Factors and Bottlenecks Affecting the Project Implementation**

On the technical side, key success factors are the timely implementation and commissioning of the modernized substation (except minor schedule delays, according to the interview with KPLC); a well-designed management, including close cooperation with KPLC and Kenyan providers of works and

services; state of the art technical design engineering; and O&M training designed and executed by Hitachi-ABB, which has been a guarantor of the sustainable operation of the Substation so far, making possible the supply of stable, reliable and modern electricity services to consumers.

With regard to the EPC contractor's organization during implementation, several interviewees acknowledged the importance of having a Finnish ABB representative in Nairobi, which made the communication run more smoothly.

Another success factor during implementation was Embassy's support in facilitating meetings with MOF and MOE to resolve issues such as delayed payments. After the project was already commissioned, Embassy facilitated the release of spare part delivery from the customs.

The bottlenecks included:

- **Timing:** In 1990 ABB Strömberg Oy signed a Letter of Intent with KPLC to renew the Juja Road and other package of Substation, however due to the political and economic situation of Kenya (Kenya was not considered to be credit-worthy) a project kick-start was not possible, only in 2004 KPLC requested ABB Oy, to update the renewal of Juja Road Substation proposal, which ABB submitted in January 2005. The project finally started in 2014.
- **Unusually long preparation time:** Embassy staff facilitating project preparation and agreements changed several times during the preparatory time. Even if the project had been considered as a priority when the discussions and preparation first started, towards 2010 it had lost the priority status at the Embassy, and the personnel at Embassy had little knowledge of the CCS instrument and expectations from the Embassy. Further, during the years, connections to the relevant local counterparts became inactive. Another consequence of the prolonged preparatory phase was that OECD notification was given as many as 5 times by FINNVERA; this was due to delays (notification is valid 2 years) and changes in the project.
- **Procurement:** Restricted tendering was applied for procurement of the Finnish contractor, in accordance with Kenyan legislation. The results of the first round conducted in 2011 were nullified. A new bidding was arranged in 2012, resulting in ABB's selection as the Finnish contractor (see Finding 15 for details).
- **Budget:** (i) the original buyer credit guarantee application of May 2005 was EUR 10 million (based on the estimate of the 1990 proposal); (ii) the updated total budget estimate of January 2006 was EUR 15,2 million (the 2005-Feasibility Study estimated a budget of Euro 17 million); and the final approved contractual budget was EUR 19,3 million (foreign portion) and \$4,670 million (local portion). During to the long preparatory time, the Project budget increased due price inflation, change of scope, and change of technology from AIS-outdoor to GIS-indoor,
- **Payments:** the slow process of payment approval and execution, as well as dealing in some cases with difficult local sub-suppliers and providers of works and services, as confirmed by Hitachi-ABB during the video interview conducted by the evaluation team on 31 August 2022, payments took between 2-4 months to process. Even though KPLC handled the invoices well in time, delays were caused by MOEP and Treasury.
- **Other:** Political unrest and disturbances, the weak financial condition of KPLC affecting the period of validity of the contract, change of legal and regulatory frameworks, unclear scope due to additional and unforeseen works and services, inability of the client to process needed permitting. In summary, the consequence was a loss of profit for the EPC contractor (source, Hitachi-ABB).

#### **Finding 14: Roles and Contributions of Project Actors during Implementation**

Contributions of the Project actors on the Finnish side,

- The MFA in Finland, the approving agency for projects using concessional and grant based funding for technical cooperation from Finland, was responsible for supervising that the funding is used for the purpose determined in the funding decision. The MFA was particularly acknowledged for its support in facilitating contract continuation, which was critical for ABB to receive its payments.
- The Embassy of Finland in Nairobi, playing the role of facilitator among Finnish and Kenyan actors for expediting the process of project preparation and implementation. The Kenyan Embassy was acknowledged for facilitating communication with Treasury, MOEP, and the EPC contractor related to contractual items, including expediting payment approvals, and other issues related with customs (withholding the spare part delivery once the project was already commissioned).
- FINNVERA, the export credit guarantor providing the "Buyer Credit Guarantee" to the Guarantee Holder, following the rules of the Finnish CCS, which requires a project to have at least 30%-50% of works and services of Finnish origin supplied by a Finnish company as well. FINNVERA's involvement in the project process has already lasted over two decades, which shows that it is an agency with a long-term time span.
- The Nordea Bank, is the contractual party to the loan granted to the borrower, which is The National Treasury and is responsible for processing the payments to the Finnish contractor after receiving payment approval from KPLC the final client.
- Hitachi-ABB, Finland (the former ABB Stromberg), started actively promoting the project in 1988, until the contract for the Project implementation was granted. Hitachi-ABB was directly responsible for implementing and commissioning the turn-key project up to obtaining the final acceptance and operation certificates from KPLC the project owner.

Contributions of the Project actors on the Kenyan side,

- The National Treasury, which leads the planning and management of economics and public finance, including formulation, implementation and monitoring of economic, financial and development policies at national level.
- The MOEP, which manages the energy and power sector, including sector related governance, and related strategic directions.
- KPLC, under the MOEP supervision, owns and operates most of the electricity T&D system in the country. Responsible to design and materialize the national power T&D masterplan.
- NEMA, which was established under the EMCA No. 8 (1999) is the main instrument of the GOK for the implementation of all policies relating to the environment. NEMA granted the environmental license for power T&D to the Project.

*Evaluation question 11: There was a 7-year gap between the project appraisal and the start of the project. What were the causes of this delay, are there any lessons to learn?*

#### **Finding 15: Delay in the Project Implementation**

**Background:** According to the MFA post appraisal<sup>25</sup> the Project is largely a follow-up of the former proposal: *Nairobi System Reinforcement Project, Phase I*. In 1990 ABB Strömberg Oy signed a Letter of Intent with KPLC to renew partly the Juja Road Substation together with 16 other substations, appraised by Ekono Energy in 1991. Despite positive outcome, the project implementation could not be started due to the political and economic situation of Kenya. In 2004, KPLC requested ABB Oy, to update the renewal of Juja Road Substation proposal, which ABB submitted in January 2005. Accordingly, KPLC gave green light to ABB, while Nordea submitted a Guarantee Application to Finnvera, and a revised and updated feasibility of the 1991 appraisal study, was delivered in November 2005.

**Budgetary aspects:** according to the same MFA source above, the original buyer credit guarantee application, dated 25 May 2005, was for EUR 10 million. The estimate was based on the 1990 proposal. The renewed total budget estimate (Jan 2006) was EUR 15,2 million, while the calculation of the Feasibility Study estimates the project to cost Euro 17 million. According to Hitachi-ABB sources<sup>26</sup>, the final contractual budget (100% paid as of January 2021) was EUR 19,309 million (foreign portion) and \$4,670 million (local portion). ABB also mentioned that the project finance caused long payment time towards Hitachi ABB, as payments took from 2 months up to 4 months to process. Even though KPLC handled the invoices well in time, delays were caused by slowness between the MOEP and Treasury.

**On the Procurement Regulations,**<sup>27</sup> the new Public Procurement and Disposal Act was enforced on January 2007 as previously the public procurement sector had operated without clear rules, thereby creating avenues for corruption. As stated by the consulting company Niras<sup>28</sup>, *“meetings with the KPLC management and other Kenyan authorities demonstrated that although direct purchase is possible in the case of the Juja Road Substation project, the spirit of the new legislation would not encourage the selection of this option, therefore the Kenyan authorities and MFA decided against direct purchase and a restricted bidding competition was finally arranged in 2011”*.

This fact was confirmed by KPLC on the field visit during the interview with KPLC’s Project Accountant, who additionally explained that the approval of standard procurement procedure comprised (i) approval from the Central Tender Committee of KPCL; (ii) approval from the MOEP; and (iii) approval from the National Treasury and Planning. To comply with the Kenyan legislation, and the Finnish requirement of having 30%-50% of Finnish content of works and services is complied, KPLC proposed eventually a restricted tender for Finnish suppliers.

In conclusion, while deciding to follow the spirit of the new procurement legislation by doing procurement through restricted tendering, the process took its time and added to the delay in starting the project, however it adhered to the principles of good governance, which has also been one of the focus areas of Finnish Development Policy.

**On the Procurement Process,** the first bidding action was conducted in 2011, which was rejected on the basis of requested technology, namely a specified outdoor AIS system which was not practically possible to implement. Decision was made to retender for full equipment as an indoor GIS system. The tender was done in 2012 and contract was finally awarded to Hitachi-ABB of Finland (information provided in the questionnaire by KPLC). Basically, the initial specification was misleading, which could have

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<sup>25</sup> Niras (2013). Evaluation of Bidding Documents

<sup>26</sup> Hitachi-ABB Power Grids Finland (2021). Juja Road and Ruaraka Project. Final Report p. 6-7

<sup>27</sup> Ramboll (2007). Juja Road Substation Renewal Project. Post-appraisal Report

<sup>28</sup> Ministry of Foreign Affairs Finland (2007). Ramboll. Juja Road Substation Renewal Project. Post-Appraisal Report. Chapter 2, 3.1

been avoided if the KPLC team would have had adequate technical capacity, or if the tender could have been run with a more active participation of the MFA by providing stronger engineering advisory.

*Evaluation question 12: How were the environmental and health & safety standards put into practice in project implementation?*

**Finding 16: Environmental, Health & Safety Standards of the Project**

**Environmental Screening, Scoping and Licensing:** An Environmental and Social Impact Assessment (ESIA) study of the renewal of the Juja Road Substation from an Air Insulated Switchgear system (AIS) to a Modular Switchgear System (MSS) was conducted in 2010 by the company LOG Associates, Nairobi, Kenya ahead of the project's official start of civil work, funded by KPLC.

The ESIA had the objective of identifying significant environmental and social impacts associated with the proposed project and recommending appropriate mitigation measures for integration during project implementation. The ESIA experts carried out the identification of an assessment of potential environmental and social impacts of the project. The scope of their work was to identify all potential significant adverse environmental and social impacts of the project and recommend measures for mitigation. They thereafter prepared an Environmental Impact Assessment report compliant with Kenya's Environmental Management and Coordination Act (EMCA 1999) detailing findings and recommendations.

Regarding the Health and Safety (H&S) plan, it is responsibility of the EPC contractor Hitachi-ABB, which shall be approved by the owner KPLC. Hence, the H&S plan and management was done, approved and supervised by Hitachi-ABB as their standards were of a higher level than KPLC. However, KPLC actively participated in H&S activities as related to the maintenance and make safe the old switchyard for works as well power outage works (Hitachi-ABB, evaluation questionnaire).

Hitachi-ABB maintained a record of H&S incidents at workplace<sup>29</sup>, where the incidents are divided in 7 categories: fatal incident; serious injury incident; high potential incident; lost time injury; medical treatment injury; first aid and; near misses. The statistical record of cumulative H&S data from June 2015 to July 2018 has shown that during 370,000 hours of work only 383 cases of near misses due to unsafe acts or unsafe conditions; 51 cases of 'first aid'; and 1 case of 'lost time injury'. Based on this record, the contractor was able to successfully prevent H&S events under difficult working conditions during Project implementation, i.e., work with energized HV cables. Also workplace injuries to public were completely avoided, according to the records.

The Environmental Management Plan (EMP) is responsibility of the EPC contractor Hitachi-ABB, which shall be approved by the owner KPLC. As stated by Hitachi-ABB during the video interview on 31 August 2022, during project implementation ABB did not prepare a separate EMP, however the environmental impacts was managed through the Hitachi-ABB project execution and quality instructions which specifies a minimum level to be complied in the project implementation (Hitachi-ABB, evaluation questionnaire).

The EMP handled waste management, one of the main components of concern of the project, with significant waste loads from decommissioned steel gantry, power equipment, and copper from power cables as final products of dismantling the old substation. The copper cables, including protection and

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<sup>29</sup> Data received from Hitachi-ABB on 18.10.2022

control cables; circuit breakers and disconnectors; and power transformers were as much as possible reused.

### 3.4 Impact

*Evaluation question 13: How well did the project succeed in achieving its overall objective to improve the quality of life of the beneficiary population, contribute to economic development and support the delivery of public services?*

#### **Finding 17: Improvement of Quality of Life of Beneficiaries and Economic Development**

Traditionally the Juja Road Substation has been serving, in addition to the Nairobi area, peripheric and suburban poor areas, including slums. KPLC mentioned during the face-to-face interviews in Nairobi, that the impact of having stable, secure, and reliable electricity services has been reflected in a growing commercial and industrial (mostly small and micro-industries) customers. In addition, interviews with randomly selected beneficiaries of the Project living close to the Juja Road Substation confirmed the statement of KPLC above.

The Juja Road Project has been contributing to the economic growth of beneficiaries' (regular and marginalized) mainly commercial and micro-industrial businesses by substantially improving the reliability and efficiency of the power supply. While the project has positively affected the population at large in the coverage area, it does not per se, ensure access to electricity to the poor. Poverty reduction, or the improved economic status of beneficiary clients has not been discussed in detail in project documents or in other baseline studies.

*Evaluation question 14: What are the project impacts in different levels: 1) Clients of KLPC; Residential, commercial, industrial, public services within the Sub-station service area; 2) KPLC staff; 3) project affected people?*

#### **Finding 18: Project Impacts at Different Beneficiary Levels**

The Appraisal report (2007)<sup>30</sup> confirms the high priority of the Project at national and provincial development plan levels, while being aligned with the national and provincial policies. Hence, the Project has been following the principles of the NEP (2004) where the GOK recognizes that economic recovery comes in hand with "*ensuring adequate supply of affordable energy to stimulate economic growth*".

Thus, the outcome of improving reliability of supply of electricity services at a lower cost, has been translated into a social and economic global impact of having additional electricity services to strengthen residential, industrial, and commercial clients (confirmed during the interviews with KPLC in Nairobi). Environmental benefits as less deforestation (less use of wood as fuel source), increased access to modern forms of energy, and regional equity in form on transboundary interconnections (i.e., power from Uganda). The Project has therefore, substantially achieved the expectations on global social, economic, and environmental impact to beneficiaries.

In addition to the need for rehabilitation of infrastructure for energy generation and T&D, it is recommended to keep a dynamic pace in reform implementation for making more effective the existing power sector regulatory framework, including institutional accountability to keep developing a

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<sup>30</sup> Ministry of Foreign Affairs Finland (2007). Juja Road Substation Renewal Project. Appraisal Report. Chapter 2.4

consistent legal and regulatory framework to increase private sector participation and investment in the power sector.

At project level a modern, a safe and reliable substation with an increased capacity and minimized need for maintenance operating with a reduced environmental footprint has been delivered (site visit and inspection of Juja Road Substation on 27 September 2022). The above, has contributed to increase the quality of life and economic development of residential, commercial and industrial beneficiaries, which was confirmed by KPLC during the field mission.

*Evaluation question 15: What other noticeable impact did the project have (intended/unintended, positive/negative), particular in terms of human rights, gender equality, inequalities and environmental sustainability?*

### **Finding 19: Other Project Impacts**

References to cross-cutting impacts as i.e., gender equality, human rights, and environment remained in general almost unperceived largely due to lack of a context analysis to put them in practice.

**Human Rights**, which is the perspective of the project beneficiaries of having access to a formal and accessible grievance redress mechanism (expressed grievances being addressed adequately) was not there.

**Gender Equality**, the Project design did not carry out a gender analysis to understand how the outputs, outcomes, and impact will affect men and women separately.

**Environmental and Social Impacts**, the analysis of environmental and social aspects should have addressed environmental impact of the intervention, including climate change aspects from the perspective of adaptation and mitigation when relevant. The assessment indicates also that the upgrading of civil works at the Juja Road Sub-Station occasioned a measure of environmental and social impacts, however also resulting qualitatively in significant economic and environmental development outcomes. The major environmental and social impacts raised by the residents during the upgrading works at the sub-station were mostly local, minor and reversible. These impacts included the following:

- *Traffic congestion in the area, during the period of construction*: the GIS components were delivered by trucks, and the area is only served by a single-lane tar road, which resulted in traffic congestions
- *Machinery noise*: heavy construction equipment was deployed, with the consequences felt by the neighboring community
- *Vegetation disturbance in and around the construction site*: the sub-station area is bare of vegetation, and it appears that land was set aside for the construction of the sub-station
- *Fugitive dust*: the soils in the area are highly friable and prone to generation of dust vortex. Particulate matter 2.5 is a particular concern for the area, seeing the soil type and the low level of paving of public spaces. The laying of gravel and other aggregates in the site set aside for the sub-station somewhat minimized this issue, to some degree.
- *Occupation health and safety risks*: During the interviews KPLC spoke of 100% accident-free record of the project during the construction phase. The contractor has mentioned one incident of lost time and 51 first time incidents. On the other hand, residents have not mentioned being affected by this occurrence during the construction phase.
- *Waste management*: there was considerable amount of waste material generated during the construction phase. Waste management was a big component of the project, with significant



waste loads for decommissioned steel gantry equipment and copper-based power cables, as part of the dismantling of the old station. The copper cables, including protection and control cables, as well as circuit breakers and disconnectors, were recovered for reuse.

- *Labour grievances*: low-level disputes on labor, contracting, overtime, etc.
- *Temporary disruptions in local electricity supply*: some residents mentioned this as an impact during the construction phase.

*Evaluation question 16: Did the positive project impacts reach marginalized or vulnerable communities? I.e., to what extent did they benefit from improved electricity supply?*

#### **Finding 20: Project Impacts Reaching Marginalized or Vulnerable Communities**

As a background, according to publicly available data sources on national statistics<sup>31</sup> Kenya has some of the largest urban poor areas in Africa. In Nairobi alone, a city of 3.4 million people, a significant proportion of its urban dwellers live in informal settlements. Traditionally, majority of the dwellers in these settlements had to rely on poor-quality and unsafe electricity. This means that households had to buy illegal connections from local cartels. Services and business activity were highly constrained, insecurity was rife, and electric fires and electrocutions were common.

As a result, supply of electricity to informal settlements has always been a challenge for the Kenya government and specifically for the electricity power utility, Kenya Power.

With funding from Development Partners KPLC began undertaking a major scale up of electricity connections in urban poor settlements, especially in Nairobi metropolitan area.

After the survey conducted during the field mission, it can be confirmed that the Project benefits did actually reach the poor and vulnerable communities. However, the Juja Road Substation manager mentioned that there are no formal metrics collected yet to measure the benefits and impact of the Project on customers and incumbent communities.

**Positive Social Outcomes:** The following have been mentioned by respondents (beneficiaries) randomly interviewed for this study:

- More reliable, stable and secure power supply. This has enabled more business opportunities for the area residents, who mentioned that their enterprises are now working more hours and able to secure more income. This was a contrast to the period before 2017, when there was frequent load shedding and attendant impact on business incomes and livelihoods.
- Direct and indirect skilled and non-skilled employment opportunities. A number of people were employed directly (working at the sub-station with ABB and Kenya Power) and indirectly supporting the operation, through supply of materials and services, including food and transportation services for the workers building the sub-station's GIS components. In particular, the residents mentioned that there was a market for supply of construction materials during the civil works phase of the project.
- Boosting of the informal sector. As a result of the transformation of the power grid in the area, there is a noticeable boosting of the informal sector, with a massive increase in the quantity

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<sup>31</sup> World Bank. 2022. Population living in slums – Kenya. Accessed on September 8, 2022, at <https://data.worldbank.org/indicator/EN.POP.SLUM.UR.ZS?locations=KE>

and quality of small- and medium-scale outlets serving the informal sector: restaurants, butcheries, salons, vehicle repair garages, new housing apartments for the working class, among others.

- Gains in the local and national economy and increase in revenue. This has been mentioned by Kenya Power and concerns a 50% increase in power supply and stability to the city. Consultations with businesses and other stakeholders, including European Investment Bank (which co-chairs the Development Partners' Energy Forum for Kenya) also show that reliability of power supply in the city has improved significantly.
- Increased security in the area. As a result of the enhanced power stability, the government constructed high-mast lighting system in the area. This helps with night-time lighting and enables more movement of people and goods at night. Peoples' perceptions of security have therefore changed, with more people feeling safe moving and trading at night.

### 3.5 Sustainability

*Evaluation question 17: How sustainable are the results achieved in the project? Have stakeholders in Kenya taken steps to ensure sustainability e.g., in budgeting or other processes? Are the project results still relevant and are the systems installed/other outputs of the project still in efficient and effective use?*

#### **Finding 21: Project Sustainability**

The initial desk review and interview conducted with Hitachi-ABB in Finland during inception phase, and later on the interviews conducted with KPLC's Juja Road Substation management during the field mission confirmed that all individual components implemented in the Project are functioning and performing properly according to the book.

KPLC mentioned in addition that they have interest in materializing a similar intervention at the Ruaraka Substation, which is in urgent need of modernization. Hitachi-ABB stated, and KPLC management confirmed, that the training provided during the project implementation for substation management, and O&M has shown to be efficient and effective, as the substation is providing stable and reliable electricity services as expected without interruptions. Summarizing, the Juja Road Substation is one of the key and unreplaceable components of the Kenyan T&D system.

*Evaluation question 18: Is the operation and maintenance capacity (technical, financial) of KLPC in adequate level to maintain and upgrade the investment? Is there an O&M plan, is it being implemented?*

#### **Finding 22: O&M of the Juja Road Substation**

On the technical management side, Hitachi-ABB conducted a detailed capacity building program for managers and operators of the Juja Road Substation. The educational program included a hands-on training at the ABB GIS-switchgear factory in Finland and Germany. Based on the interviews conducted during the field mission, the local team of engineers is 100% capable to manage and operate the Substation. In addition, the Substation has a record of effective and efficient performance without shut-down events.

### 3.6 Coordination, complementarity, coherence, aid effectiveness

*Evaluation question 19: How were other programs and cooperation relevant to the project taken into account?*

#### **Finding 23: Relevance of other Cooperation Programs to the Project**

The consistency of the GOK towards their development goals, has triggered substantial multi-donor interventions to develop the power sector supported by the World Bank, European Investment Bank (EIB) and Nordic Development Fund (NDF) which has been designed to address many of the institutional weaknesses and increase customer connections in under-serviced areas.

According to the documentation provided during the inception phase, KPLC decided to exclude the Juja Road Substation Project from the general time schedule of the World Bank's Energy Sector Recovery Project (ESPR)<sup>32</sup>, especially the distribution reinforcement and upgrade component, mostly to ensure the Project independence from the World Bank Program.

During the field mission, the interview held with the EIB energy sector specialist revealed that EIB is open to cooperate on a loan syndication with Finland for funding power related projects in Kenya.

The focal area of EIB is to work across the value chain of the power industry with both public and private sectors: (i) Power generation in cooperation with KenGen, hydropower (Kamburu Dam), geothermal, power transmission; (ii) funding IPPs for renewable energy-based power as i.e., the wind power plant in Lake Turkana, solar PV plants Eldoret and Garissa, on-lending for solar home systems, and Last Mile connectivity (7 million as of now, with 2 million new connections over the last 2 years)

*Evaluation question 20: How well did the project promote ownership, alignment, harmonization, management for development results and mutual accountability?*

#### **Finding 24: Relevance of Development Results and Mutual Accountability**

On one side, KPLC operates and manages the Juja Road Substation in a cost-efficient, reliable, and sustainable manner delivering stable and secure electricity services to customers, on the other it works together with the Development Partner community, demonstrating higher standards of business ownership, responsiveness towards its own corporate development.

The above is the baseline for promoting and securing KPLC's institutional right alignment, harmonization, management for development results and accountability towards the different donor-funded interventions promoting the Kenyan power sector expansion and modernization. KPLC's commitment to the Kenyan power sector growth is consistent with the existing development policies, and strategies of the GOK for fighting against economic and energy poverty.

*Evaluation question 21: Were there contradictions with other policy areas and how were they handled? How did the project impact debt sustainability of Kenya?*

#### **Finding 25: Consistency with other Policy Areas**

As mentioned above, the Project contributed to materializing the following policy instruments:

- Economic Recovery Strategy for Wealth and Employment Creation (ERSWEC, March 2004);
- Economic Recovery Strategy Paper (ERSP, June 2003);
- Sessional Paper No. 4 of 2004 on Energy, the National Energy Policy (NEP);
- The National Climate Change Policy Framework;
- The Climate Change Act (2016);

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<sup>32</sup> Ministry of Foreign Affairs Finland (2007). Ramboll. Juja Road Substation Renewal Project. Post-Appraisal Report. Chapter 2.1

- The Nationally Determined Contribution (NDC), and
- Environmental and Social Policy and Regulatory Framework (refer to sub-chapter 2.1 above).

**Finding 26: Impact on Debt Sustainability of Kenya**

The project budget of Euro 24 million, was composed by a concessional loan to the Kenyan Treasury of Euro 20 million (debt) and a Euro 4 million grant, a non-reimbursable component. Treasury on-lend the loan component to KPLC, which amount shall be collected from the end beneficiaries (residential, commercial and industrial). Based on the above, the small amount of the Project, and the concessional nature of the debt, is out of relevance as a factor affecting the debt sustainability in Kenya.

### 3.7 Other

*Evaluation question 22: Did the project open up new business for the Finnish companies in Kenya or to other emerging markets? Was the project part of a strategy by the companies to expand operations in developing countries?*

**Finding 27: Project Relevance to Developing New Business Opportunities for Finland**

According to the statement of Hitachi-ABB expressed during the video interview on 31 August 2022 (inception phase), the project planning and preparation was a long and resource intensive process. The Juja Road Substation Renewal Project was an intensive follow-up of the originally proposed 'Nairobi System Reinforcement Phase 1- Project, for which ABB Stromberg Oy signed a Letter of Intent with KPLC in 1990 to partially renew the Juja Road and other Substations. The actual Juja Project implementation could not start due to the political and economic unrest situation in Kenya during the 1990's. Then, in 2004, KPLC requested ABB Oy to update the Juja Project proposal, but it took again over 10 years until the project implementation could eventually kick-start.

The CCS requires that the Finnish content (materials and equipment of Finnish origin) to be at least 30%-50% and the supplier to be a Finnish company as well (assessment by Finnvera confirmed that the estimated Finnish content of the contract value was 51,3%<sup>33</sup>). The Project related content of components of Finnish origin included power transformers, control and protection systems, power cables, GIS halls, project engineering and project management. In addition, the local site office and organization was managed by ABB Finland and ABB Kenya<sup>34</sup>. Hitachi-ABB mentioned that they have not sold other similar GIS-modular packages to Kenya or other emerging markets. The reason behind it, is that the company has been fully engaged with the Finnish and European regional markets. However, there is currently one project under preparation with similar equipment and modular package using PIF-financing, namely the modernization of the Ruaraka Substation.

Capitalizing on this important experience, Hitachi-ABB is looking for new opportunities to market similar GIS-modular packages to other emerging markets in future as well.

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<sup>33</sup> Ministry of Foreign Affairs Finland (2007). Juja Road Substation Renewal Project. Appraisal Report. Chapter 1.3 and 12.1

<sup>34</sup> Hitachi-ABB Power Grids Finland (2021). Juja Road and Ruaraka Project Presentation to the MFA 1.10.2021. Slides 11-15.

*Evaluation question 23: How did the project contribute more broadly to cooperation and relations between Finland and Kenya? Were there synergies with other Finnish cooperation in the region, such as the Lake Turkana wind park (funded by Finnfund)?*

**Finding 28: Project Relevance to Cooperation for Development Finland-Kenya**

On the contribution of the project to a broader cooperation and relationship between Finland and Kenya, the MFA mentioned during the evaluation kick-start meeting (video conference) that synergies with other Finnish cooperation initiatives in Kenya were created, such as the "Lake Turkana Wind Park Project (funded by Finnfund).

Later on, during the field mission in Nairobi, KPLC's Acting Managing Director mentioned that he was not aware of the development of the Lake Turkana Wind Park Project, though he mentioned that KenGen may have more information about it, as renewable energy project developments are in hands of independent power producers (IPPs). Nevertheless, KPLC mentioned that Hitachi-ABB is pursuing a similar techno-financial development approach as used for Juja Road Substation, with the modernization proposal of Ruaraka Substation.

In term of Finnish visibility, some of the Finnish interviewees did acknowledge the project's strategic importance to the Kenyan power sector and credited the project as the Embassy's flagship project. The evaluation results have confirmed the project being a success in terms of improving the efficiency and reliability of electricity distribution for millions of people in Nairobi and beyond.

*Evaluation question 24: How was the project viewed by local ministries and did it meet their objectives?*

**Finding 29: Perception of the Project among Public Sector Actors in Kenya**

During the interview with KPLC management during the field mission, KPLC confirmed that the overall perception of the project has been very positive as the project has provided with expected results. It was also confirmed that the sector authorities are satisfied with the outcomes and impacts of the Project. The Kenyan authorities have been very satisfied with the Juja Road project and have expressed their gratitude and interest for PIF financing for additional projects with similar features as kt is the case of the Ruaraka Substation Project<sup>35</sup>. The Kenyan Treasury and Finnfund were involved in the process for funding approval.

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<sup>35</sup> Hitachi-ABB Power Grids Finland (2021). Juja Road and Ruaraka Project Presentation to the MFA 1.10.2021. Slide 36 to 43.

## 4. Conclusions

### 4.1 Relevance

Since its final commission in 2018 formally sealed with the operational certification document, the Project has demonstrated a most relevant contribution to provide modern and efficient electricity services. Being relevant in improving electricity services in the Nairobi area and beyond at national level with stable, secure and reliable power supply to consumers. Therefore, fulfilling the mandate of the GOK's development policy and strategy, to reduce poverty by means of reliable electricity services, in addition the project fits into Finland's development cooperation strategy to promote technology innovation in African countries towards SG1 "no poverty". In summary the Project, *"has been ensuring adequate supply of affordable energy to stimulate economic growth"*. (Reference: Findings 1, 2 and 3).

On Climate Change related aspects, the GOK focuses on climate mitigation, hence having power infrastructure providing efficient electricity services to consumers adds to the equation of reducing additional need for thermal generation, while optimizing the output of low carbon electricity generated by renewable energy-based plants. Vis-à-vis the above, the GOF emphasizes on strengthening both, climate change adaptation and mitigation. Thus, promoting energy efficient power infrastructure copes with the climate policy of both countries. (Reference: Findings 4, and 5)

### 4.2 Effectiveness

The Project has been able to supply to approximately 50% of the population of the metropolitan area of Nairobi, which is estimated to be around 9,4 million according to the 2019 census, hence fulfilling the effectiveness criteria of significantly improving, in terms of quantity and quality, the supply, and reliability of electricity services. (Reference: Findings 6, and 7).

Key success factors are the successful and timely implementation and commissioning of the modernized substation, a well-designed management and O&M training provided by the EPC contractor, which has been a guarantor of the sustainable operation of the Substation so far, making so possible fulfilment of the expected outputs and outcome of the Project. Finnish and Kenyan actors demonstrated professionalism and contributed individually to the success of the Project. Bottlenecks hindering expected outputs included the slow process of payment approval and execution, as well as dealing in some cases with difficult local sub-suppliers and providers of works and services, as confirmed by Hitachi-ABB. (Reference: Findings 8, and 9)

### 4.3 Efficiency

Available resources were the funding, technology, know-how, and labour. Based on the desk assessment and results of the interviews on site, including information provided in the evaluation questionnaires, the results can be catalogued as highly efficient demonstrating a good value for money. The turn-key modality of the Project was a key success factor for timely implementation, besides there was no report of any case of corruption.

The project preparation took over 10 years, even after the economic conditions in Kenya became again favorable in the early 2000's. A long preparatory phase reduces the real context of the project as inflation, and market diversification affect the financial side; changes in technology, and expertise modify the scope of the project. Nevertheless, Finnish and Kenyan actors demonstrated professionalism and contributed individually to the success of the Project.

Finnish and Kenyan actors demonstrated professionalism and contributed individually to the success of the Project (Reference: Findings 10, 11, 12, 13, 14, and 15).

On Environment, Social, and Health & Safety aspects were managed by Hitachi-ABB, as they follow international guidelines and good practices, providing herewith with an additional added value to the Project. (Reference: Finding 16)

#### **4.4 Impact**

The Project impact to the quality of life of beneficiaries has been notorious, referring to the socially related findings on relevance and effectiveness, the Project operation has been facilitating reliable and additional electricity services to residential customers, which can be translated into better quality and standards of life (refrigeration, lighting for education, and sanitation), to commercial and industrial customers which can be translated into better and stable business opportunities, eventually creating additional social and economic perspectives. Additional poor and vulnerable consumers are the new beneficiaries from new connection programs funded by Development Partners and implemented in parallel by KPLC. Regarding public services, water, sanitation, health, and sewage have benefited as they are stable and reliable now. However, no human rights, or gender equality dimension identified during evaluation. (Reference: Findings 17, 18, 19, and 20)

#### **4.5 Sustainability**

Hitachi-ABB stated, and KPLC management confirmed, that the training provided during the project implementation for substation management, and O&M has shown to be efficient and effective, as the substation is providing stable and reliable electricity services as expected without interruptions. The O&M plan was designed under highest quality standards, and is performing well. (Reference: Findings 21, and 22)

#### **4.6 Coordination, complementarity, coherence, aid effectiveness**

The EIB confirmed that it would be open for a cooperation with the MFA of Finland and KPLC for funding power sector related interventions, either of public or private nature. As the Project has demonstrated consistency with development policies, national and from development partners, including demonstration of sound and consistent achievement of outputs, outcomes and impacts, it fulfils the conditions of harmonizing development of results, complementary, and coherence of the power sector. On the debt burden for Kenya, the budget is too small for creating a negative impact, besides the Project has an excellent value for money. (Reference: Findings 23, 24, 25, and 26)

#### **4.7 Other**

The results showed by the Project, including lessons learned, are the best guidance to be used as a relevant template for future engagements using Finnish technical cooperation for development resources, which is open to be combined with other inputs from the development partner community active in Kenya. Prove of it is the preparation of the next modernization project of the Ruaraka Substation, in addition to the preparation of the Lake Turkana Wind Park. Based on the above, the perception of the public sector institutions towards the Project is positive, according to KPLC. (Reference: Findings 27, 28, and 29)

## 5. Recommendations

### Recommendation 1: Project Preparation Phase

- a) Project Budgeting: The MFA is advised to use the modality of project portfolios, instead of individual actions. The level of effort to process an individual project is almost the same as processing a project portfolio. The networking with the Development Partner community should be strengthened, as project syndication creates needed synergies in terms of budgeting and expertise, while optimizing risk management. The Embassy of Finland (EOF) should play a pivotal role here.
- b) Project Promotion: The MFA in coordination with the Finnish Chamber of Commerce/Industry, potential contractors, and manufacturers should promote Finnish technological solutions in form of technical missions to the target countries. Thus, feasibility design will include the appropriate technology at early stage.
- c) Appropriate Project Feasibility at Early stage: The technical feasibility should target technologies according to the nature of the project at early stage. In the case of the Juja Road Substation, the initial system specifications at 132/66/11 kV levels were done for outdoor Air Insulated Switchgear (AIS), meaning the substation should have been shut-down for project implementation and commissioning, which is unthinkable to do as the substation feeds a large portion of the national power system. Only at a later stage, it was changed to indoor Gas Insulated Switchgear (GIS), which allowed to keep the substation running during project implementation and commissioning. It is recommended to the MFA to engage third party engineering for assessment and due diligence, which will lead to shorter and efficient timing.
- d) Project Monitoring instruments: The Results Framework or Logical Frame Approach (LFA) and the Theory of Change (TOC) mechanism should be created at early project stage, and never using the “reconstruction” modality. It is understood that only after 2016, projects using CCS/PIF related instruments are required to include LFA and TOC. Such limitation may be alleviated by providing additional consultancy resources for proper identification of relevant stakeholders and calculation of indicators based on real operational data of the project.
- e) Project Safeguards: Assessment of Environment, Social, Poverty, and Resettlement aspects are key and mandatory in the Development Partner Community, including multilateral and bilateral cooperation. The Juja Road Substation Project lack on such important components, although it was mentioned the Environmental Impact Assessment (EIA) was conducted by a third party, the evaluation team could not check on the quality of the document as it was not shared by the owner.
- f) Specific Roles of Stakeholders: The MFA is recommended to have a consistent data base of the project documentation, where the project implementation process is recorded. This fact will help development of additional project (portfolios) for Finland. As it is the case in other European countries (Germany through the KfW, Austria through ADA, France through AFD/ Expertise France), the GOF may provide some advisory budget for project development.
- g) Coordination: The Contractor should be coordinated by the MFA/EOF for compliance with the project safeguards.

### Recommendation 2: Project Implementation and Administration Phase

- a) The MFA/EOF are recommended to conduct the first project review at implementation stage (mid-term review) to comply with LAF and TOC proceeds.



## 6. Lessons learnt

1. DESIGN: The project design was based on technical and budget aspects, hence (i) lack of Results Framework, and safeguards (Environmental, Social, Resettlement, Poverty), as it is standard for development cooperation projects was absent. This fact caused a lack of clarity in assessing results (outcomes and impacts). In addition, it has been recommended that future project, may seek for syndication with the Development Partner Community in Kenya, thus the above will be needed.
2. EVALUATION: An evaluation exercise without targets and indicators (lack of Results Framework) is cumbersome, as ex-post assumptions will not be exact. Projects executed before 2016 (when no Results Framework was required, according to the MFA) have the need of additional resources for assessment. Projects executed after 2016, should include a mid-term review.
3. PROJECT PROMOTION: MFA and the Embassy of Finland, should continue to play its role, together with Chamber of Commerce/Industry of Finland to keep the business moving for promoting transfer of Finnish know-how, to contribute to SDG 1 (“No Poverty”); SDG 6 (Energy for All); and SDG 13 (Climate Action), which are an integral part of the policy for technical cooperation for development of Finland.

## Appendixes

### Appendix 1: Terms of Reference

#### TERMS OF REFERENCE

Ex-Post Evaluation of Concessional Credit Scheme Projects: The Juja Road Substation Renewal in Kenya

#### 1. OVERALL BACKGROUND TO THE EVALUATION

The Public Sector Investment Facility (PIF) is one of the Finnish government's financing instruments in the development policy field. Its purpose is to provide financial support to developing countries' public sector investments that are aligned with the UN sustainable development goals (SDGs) and that make use of Finnish technology and know-how. PIF financing is a form of concessional investment credit provided by a financial institution to the target country, which in addition to an interest subsidy element includes other support measures of the Finnish government's development cooperation.

PIF was launched in December 2016. It was preceded by the Concessional Credit Scheme (CCS) that was discontinued in 2012. The CCS was based on the same legal framework as PIF and it had similar objectives to PIF in promoting economic and social development in developing countries by making use of the experience and technology of Finnish companies. However, the scheme was criticized for not focusing sufficiently on achieving development results, which contributed to the decision to discontinue the scheme.

As part of the decision to launch the PIF instruments, steps were taken to ensure a stronger focus on development results. One of these steps is to increase the number of end of project evaluations of PIF and CCS projects. The aim is to generate information on development results and lessons learned from the projects particularly to support programming and management of the PIF financial instrument.

#### 2. BACKGROUND TO THE PROJECT TO BE EVALUATED

##### Project in brief:

The Juja Road project was a power substation turn-key delivery in Nairobi, Kenya. The project was financed by concessional credit arranged through Ministry of Foreign Affairs in Finland. The Client was state owned company Kenya Power Lightning Company, KPLC. KPLC owns and operates most of the electricity distribution system in Kenya and sells electricity to over 7.5 million customers (as at end of June 2020).

The project was a refurbishment project for one of the largest and most vital substations in Nairobi Kenya. The old 132/66/11kV Juja substation was built some 50 years ago and has been extended and modified several times compromising the reliability of the station. Juja Substation was one of the least reliable substations in Kenya. After the project completion, based on Hitachi ABB's assessment, the Juja Road substation is the most reliable substation owned by KPLC. In addition, the capacity of the station increased from 255MVA to 360MVA after the refurbishment.

Following equipment, services and trainings was included in to the scope of supply:

- Supply and installation of Gas Insulated Switchgear (GIS) for 132 kV and 66 kV voltage levels and 11 kV switchgear.
- Design, delivery, installation and commissioning of two new 90MVA transformers, related components and connections.
- Adaptation of three (3) existing 60MVA transformers.
- Decommissioning four (4) old transformers (15, 15, 15 and 30MVA).

- A new control building to house the new equipment (GIS's, SWG, LV, DC, Control and Protection Panels and Substation Control System.)
- Design, delivery, installation and commissioning of the 132kV GIS, related components and connections, and decommissioning the unnecessary old ones.
- Design, delivery, installation and commissioning of the 66kV GIS, related components and connections, and decommissioning of the unnecessary old ones.
- Design, delivery, installation and commissioning of the 11kV SWG, related components and connections, and decommissioning of the unnecessary old ones.
- Complete KPLC maintenance team factory trainings for the GIS switchgear, SCADA, protection relays, telecommunication and relay test equipment.
- Complete set of the spare parts for all main equipment and devices
- Project Management.

#### **Finance in brief:**

The project was financed by concessional credit arranged through Ministry of Foreign Affairs, Finland. MOF Finland financed MOF Kenya by the loan/credit through Nordea Bank. MOF Kenya assigned the loan for KPLC through Ministry of Energy (MOE), Kenya. MOF Kenya, MOE Kenya and KPLC were having internal loan agreement arrangements. The loan was in EUR in accordance of the contract between Hitachi ABB and KPLC. Hitachi ABB received payments through Nordea Bank. Nordea Bank released the payments by the payment request of KPLC.

Initial concessional credit agreement commitment termination date was 31<sup>st</sup> of August 2017.

The loan agreement was extended twice as follow:

1st extension to 31st of December 2017.

2nd Extension to 31st of March 2018.

The concessional credit agreement extensions were made due to the project extension due to the civil unrest which followed the presidential elections in 2017 and several change orders Hitachi ABB received during the project execution.

#### **Project Schedule**

Project effective date was 30.12.2014. Initial project execution time was 24 months. Actual project execution time was 37 months. The Operational Acceptance Certificate date for the main project was 25.1.2018.

The project was extended through several change orders until 30th of June 2018. The last spare part shipment was held by Kenya customs almost 2 years due the unclarity in the custom clearance documents. The final shipment reached the site on 14.12.2020. The custom clearance documents were KPLC responsibility and thus beyond Hitachi ABB's control.

### **3. OBJECTIVES OF THE EVALUATION**

The overall objective of the end of project evaluation is:

- To provide an external, independent and objective assessment of the project.
- The evaluation is expected to enable the MFA to evaluate whether the project was implemented in 1) an appropriate and efficient way, 2) how well it achieved the targets and goals laid out in the project plan, and 3) particularly how sustainable the results of the project are, including any long-term development impacts of the project.

The evaluation is expected also:

- To provide the MFA with lessons-learned that can be used in further development of the PIF funding instrument
- The evaluation is expected to generate information for the MFA on the development impact of the CCS funded projects and the sustainability of these results.

#### **4. SCOPE AND GENERAL APPROACH OF THE EVALUATION**

The evaluation should focus on the project implemented in Kenya as specified in the feasibility study from November 2005. It should analyze the planning and implementation phases of the project as well as actions taken to ensure sustainability of results after the completion of the project. It should consider actions taken by the project owner and key stakeholders in Kenya, the private sector companies involved in implementing the project in Finland, Kenya and elsewhere and it should consider the support provided by key stakeholders facilitating the CCS-instrument including the MFA.

The project should be analyzed in the context of relevant development strategies of Kenya and the development policy of the Government of Finland particularly in the context of the CCS instrument at the time. Further, particular attention should be paid to gender and social equality, human rights including equal participation of marginalized groups and environmental sustainability. The evaluation should also provide information on outcomes of the project for the ultimate beneficiaries. This could require constructing a results framework ex-post and indicators as the project document does not explicitly provide these. The evaluation should also provide information on how the project contributed to the longer-term operations of the Finnish company involved in the project in developing country markets.

#### **5. ISSUES TO BE STUDIED**

The main issues should be studied against the evaluation criteria below. The evaluation team may also take up other issues.

##### **Relevance**

- Was the project relevant to electricity service in Nairobi area and the local populations that were to benefit from the project?
- Did the project contribute to Kenyan developmental goals? Was the project in line with Finland's development policy objectives and global development goals?

##### **Effectiveness**

- To what extent did the project achieve its immediate objective of significantly improving the supply of electric power to Nairobi area and surroundings, hence improving the services to local households and communities?
- What were the key success factors or bottle necks that contributed to the project either achieving or falling short of its objectives? What was the role/contribution of the different actors (project owner, contactor and other stakeholders including the MFA)?

##### **Efficiency**

- How efficiently were available resources transformed into intended results in terms of quantity, quality and time? Can the project be deemed to have been good *value for money*?
- What were the key success factors/bottle necks that contributed/constrained implementation (planning, procurement, implementation, risk management, monitoring, follow-up after close of project)? What was the role/contribution of the different actors?

### **Impact**

- How well did the project succeed in achieving its overall objective to improve the quality of life of the beneficiary population, contribute to economic development and support the delivery of public services such as education and health.
- What other noticeable impact did the project have (intended/unintended, positive/negative), particular in terms of human rights, gender equality, inequalities and environmental sustainability?

### **Sustainability**

- How sustainable are the results achieved in the project? Have stakeholders in Kenya taken steps to ensure sustainability e.g. in budgeting or other processes? Are the project results still relevant and are the systems installed/other outputs of the project still in efficient and effective use?

### **Coordination, complementarity, coherence, aid effectiveness**

- How were other programmes and cooperation relevant to the project taken into account?
- How well did the project promote ownership, alignment, harmonization, management for development results and mutual accountability?
- Were there contradictions with other policy areas and how were they handled? How did the project impact debt sustainability of Kenya?

### **Other**

- Did the project open up new business for the Finnish companies in Kenya or to other emerging markets? Was the project part of a strategy by the companies to expand operations in developing countries?
- How did the project contribute more broadly to cooperation and relations between Finland and Kenya? Were there synergies with other Finnish cooperation in the region?
- How was the project viewed by local ministries and did it meet their objectives.

## **6. METHODOLOGY**

The evaluation team is expected to determine the most appropriate methodology to use in the evaluation, particularly taking into account that ex-post there is limited availability of documentation. The team is expected to use multiple methods, both quantitative and qualitative, to ensure best outcome of the evaluation. The work should include a desk review of existing material, possible identification of further relevant material, data analysis of available statistics/indicators, interviews with relevant stakeholders and a field visit. The assignment includes an inception phase, field work and final analysis and reporting phase. The team is also expected to construct ex-post a results framework and to identify/construct indicators to evaluate results. Results should be validated using multiple sources.

The evaluation should be conducted in close cooperation with the MFA. At a minimum, the evaluation team is expected to hold (i) a kick-off meeting to discuss selection of evaluation methodology and detailed work plan; (ii) a meeting prior to the field mission that presents the Inception Report and outline detailed plans for the field visit; (iii) a meeting following the field visit that presents preliminary findings; and (iv) presentation of the final report and recommendations to the MFA. Further, the evaluation team is also expected to be available to participate in a public launch of the report.

## **7. WORK PLAN**

The evaluation should be completed by February 2023 with a public launch of the report tentatively end of February 2023. The evaluation is divided into three phases. The outputs of the assignment are as follows:

- An Inception Report will be produced within three weeks of the start of the assignment, and before the field visit.
- A first draft of the Final Report will be produced within two weeks of the field visit. The MFA and key stakeholders identified by the MFA will have two weeks in which to comment the draft report.
- The Final Report will be submitted within one week after receiving comments on the first draft by the MFA and other stakeholders. The Final Report will be commented and the final clearance will be provided by the MFA.

The evaluation team is also expected to propose and implement a quality assurance system for the evaluation. The proposal needs to specify the quality assurance process, methodology and tools.

## **8. EXPERTISE REQUIRED**

The team should have expertise related to the substance of the project, including the technology provided; experience in development cooperation and development evaluations relevant to the region; knowledge of the CCS and PIF instrument; expertise in human rights-based approach, gender, and environmental assessments.

The service provider is expected to nominate the team in accordance with the Framework Agreement on the supply of the provision of support, assessment, monitoring and evaluation of Public Sector Investment Facility (PIF) and Concessional Credit projects financed by the Ministry for Foreign Affairs of Finland (*PIF Framework Agreement*). The team proposed is subject to approval by the Ministry.

## **9. REPORTING**

The team is expected to provide an inception report, a draft final report and a final report as well as a presentation of preliminary findings and a presentation of evaluation findings. Each report is subjected to approval by the MFA. The final report should not exceed 50 pages (plus annexes) with clear findings and conclusions, as well as recommendations and any lessons learned following logically from the findings and conclusions. The Final Report should include an executive summary of two pages. All reports will be submitted to the MFA in English in electronic format.

## **10. MANDATE**

The evaluation team is expected to and entitled to discuss with relevant parties, government authorities, local authorities, civil society organizations, private sector and individuals relevant to the assignment.

The consultant is not, however, authorized to make any commitments on behalf of the Government of Finland or represent him or herself as representative of the Government of Finland.

The team shall share this TOR and/or the letter of introduction of the assignment with the stakeholders they work with. The evaluation team is responsible for organizing the meetings and field visit related to the evaluation. The MFA will seek to provide support in arranging meetings particularly at the official level.

## Appendix 2: Evaluation Matrix

**Table A2-1: Questionnaire for Hitachi ABB Finland according to the Terms of Reference**

No.	Item/ FCG	Response by Hitachi (ABB)/Finland
	<b>Technical/ Financial Aspects</b>	
1	Needed for compare main variations between offered	Please refer attachment 1 (bidding documents).
2	Could you provide the summary of the technical offer (tender stage)?	Please refer attachment 2: Commercial File (bidding documents)
3	What it was shared is actually the "Final Progress Report"	The Final progress report is "as completed" report for the project. The report says completed scope, execution time, invoicing status, status of the acceptance and operating environment impact during execution
4	Could you provide the actual "Final Report"?	You can consider the final progress report as Final Report.
5	Could you please share a final acceptance document from KPLC?	Please refer attachment 3: KPO_OAC_001
6	Could you mention any reasons/risks encountered for very long construction time?	Financial (Invoices approval chain, ) Country & Customer (Thefts, robbery kidnapping, political risks, presidential elections, riots) Project Execution (HSE risks, brown field installation) Long construction time increased possibility that projects needed dealt and mitigate the above risks. I.e., project demobilize the site in Autumn 2016 due the presidential election and riots.
	<b>Financial Details</b>	
7	Niras Consultants evaluated a bid for Euro 18,864/\$4,25 mill However, the signed contract was for Euro 19,309/\$4,25 mill  It seems that after the submission of bid proposals a post- adjustment was done due to change to Gas Insulated Switchgear (GIS) technology.	Correct. The contract price was adjusted due to the prolonged commencement of the effective date as basis of the contract term 3.2. The contract was signed 29.4.2013. The effective date was 30.12.2014. The contract was amended by Amendment No 1.
8	Could you mention the ground for the price variation (ex- post)?	Amendment no 1. did not specified the reason for the price increase in details. However, the price increase was due, the material and labor costs increase between contract signing and effective date.


9	Could you comment on the efficiency and responsiveness of KPLC on the complying with the schedule of payments?	There were delays in the scheduled payments. KPLC project personnel were cooperative and supported the execution strongly. The delays were elsewhere in higher KPLC management, MOE Kenya and MOF Kenya. The approval chain in payments and finance management itself was complicate and also that created delays.
Environmental Aspects		
10	It is understood that the Environmental Impact Assessment (EIA) was conducted by KPLC.	This is to be clarified with KPLC.
11	What was the level of compliance that KPLC requested from ABB?	KPLC demanded full compliance towards technical specification and the contractual scope. Deviations to scope, technical characteristics or laws and regulations were agreed in written.
12	Could you mention any impact mitigation actions conducted by KPLC?	Please specify what kind of mitigation actions it is referred here.



**Table A2-2: Questionnaire for KPLC based on the Terms of Reference**

**Table A2-2: Evaluation Matrix KPLC**

No.	Evaluation Questions	Response by KPLC
<b>A: Questions related to relevance</b>		
1	Was the project relevant to electricity service in Nairobi area and the local populations that were to benefit from the project?	Juja substation is right in the middle of the greater Nairobi area and therefore the upgrade project was very relevant
2	Did the improvement of power supply benefit poor and vulnerable communities? What is their ratio of beneficiaries?	This is a transmission substation project and therefore its primary objective was to stabilize the overall grid supply and more so improve the quality of power supply within the Nairobi region benefiting all the types of customers irrespective of the consumers' social economic standing.
3	Did the project contribute to Kenyan developmental goals?	Stable electric power supply implies stable public and private investment and therefore directly contributing to the development goals.
4	In particular, how did the project contribute to Kenya's climate change mitigation and adaptation goals?	Before the upgrade project was undertaken, KPLC used to dispatch diesel generators in Nairobi to support the overloaded old station. After the project implementation, more capacity was available and this led to reduced thermal generators dispatch, thus less carbon gas emission/
<b>B: Questions related to effectiveness</b>		
1	To what extent did the project achieve its immediate objective of significantly improving the supply of electric power to Nairobi area and surroundings, hence improving the services to local households and communities?	This was the direct objective of the project – reduced power outages and voltage fluctuations. Five years before and after the project commissioning comparison is as follows: Before new Juja commissioning: From 1 <sup>st</sup> January 201 to 30 <sup>th</sup> June 2017, there were a total of 182 outage incidences at Juja, with 79 of them being breakdowns (30 of them being major cases of sustained breakdowns) and the rest being programmed maintenance cases. <b>While</b> After New Juja commissioning: From 1 <sup>st</sup> July 2017 to 30 <sup>th</sup> September 2022, there has been only 15 outage incidences at Juja, with only 2 being simple transient outgoing feeder lines breakdowns while all the rest were routine maintenance cases. Therefore, overall the project implementation has directly led to much stable power supply to Nairobi area and surroundings, & indeed to the overall national power network.
2	Did the project achieve the targeted increase in electricity supply? To what extent did the reliability of electricity supply improve? Did it contribute to increased electricity coverage (new power connections)?	The old Juja station had installed transformation capacity of 255MVA, while the new station has 360MVA capacity. This is more than 100MVA additional capacity that has seen: <ul style="list-style-type: none"> <li>• More loading capacity availability at Juja</li> <li>• Improved operational flexibility at 66kV level where it has become much easier to transfer loads between Juja, and Embakasi, City Centre, Athi River and Ruaraka transmission substations in Nairobi Area. This eliminated customer supply interruptions during 66kV network maintenance in Nairobi like it used to be before the project implementation.</li> </ul>
3	Possible pre-conditions, assumptions and risks relevant to the project implementation i.e., the managerial and technical skills of the personnel, technical condition of	Before and during the project implementation, KPLC had mobilized a specialized team based at Juja to monitor and perform any corrective maintenance of the old station. This included regular use of high fidelity thermal vision cameras to pick high voltage bus hot spots and get them fixed in good time. In addition, the station was operated at much

	the substation, frequency allocations	<p>reduced capacity to avoid loading-related breakdowns due to aged hardware.</p> <p>Some of the basic assumptions were:</p> <ol style="list-style-type: none"> <li>The old equipment would sustain loading conditions</li> <li>The contractor would mobilized highly specialized technical personnel to manager and implement the project with no incidences and accidents</li> <li>KPLC would assemble a skilled project implementation team to supervise and oversee the project progress from the beginning to commissioning.</li> </ol>
4	The validity of basic assumptions and background data.	
5	The proposed plan of operations, timetable and phasing of activities.	<p>Contract signed on 29<sup>th</sup> April, 2013 Effective date 31<sup>st</sup> December, 2014 Delivery period 28 months Completion date 30<sup>th</sup> June, 2017</p> <p>Detailed Master Time Schedule herewith embedded</p>  <p>Time schedule 15_08.pdf</p>
6	What are the lessons from successes and problems to be learnt from the previous energy sector projects in Kenya?	<p>Lessons learnt:</p> <ol style="list-style-type: none"> <li>During all the stages of the project, from inception to commissioning, always involve all the stakeholders</li> <li>Spend time and resources to develop the <b>correct specifications</b> – Always accurately specify the project requirements <b>NOT</b> solution – let the expert vendors/bidders offer the optimized solutions for evaluation.</li> <li>Have clear processes for project and contract management for smooth implementation with a clear focus on the end result.</li> <li>Timeliness is critical – avoid any delays at all the stages <ul style="list-style-type: none"> <li>– Before contract awarding, ensure all the prerequisite matters are settled, such as land and environmental issues, local authorities’ matters, etc.</li> <li>– After awarding, ensure smooth project management processes such as shipment logistics, designs approvals, experts’ availability, optimized time scheduling, invoices processing, etc.</li> </ul> </li> <li>As much as possible facilitate the contractor’s team, making use of the negotiation &amp; persuasion skills to drive the project seamlessly</li> </ol>
7	The importance of training and the need for technical assistance and its scheduling	<p>The project recognized the importance of personnel training for proper operation and maintenance of the delivered GIS equipment and all the ancillaries.</p> <p>Within the scope of the project, the following training was done at the manufacturer’s factories:</p> <ol style="list-style-type: none"> <li>10 engineers/technicians in ABB’s GIS factory in Germany</li> <li>4 engineers in ABB’s Telecommunication system in Switzerland</li> <li>4 engineers in ABB’s Protection &amp; Control system factory in Sweden</li> </ol> <p>Also during the project’s execution, scheduled on-job training was conducted at all the phases of the project execution.</p>

8	What are the existing and needed knowledge and skills of the technical staff who are to work in the installation and operation of the facilities necessitate?	KPLC has skilled staff who have the necessary technical background and specialized training was done to ensure proper operation & maintenance of the delivered equipment.
9	Are there any other specific training needs, and does the Project, as specified in the feasibility study, cover all the training and technical assistance needs?	The training was exhaustive.
10	The technical appropriateness for sustainable operation and management as well as long-term cost-efficiency.	The delivered GIS station met all the requirements, key among them are: <ul style="list-style-type: none"> <li>✓ GIS is low maintenance equipment with expected useful life of 50 years</li> <li>✓ Land space – the new station was built right inside the existing live station with little land space available</li> <li>✓ Additional transformation capacity</li> </ul>
11	What are the benefits of the proposed distribution system compared to the existing or alternative systems?	The interconnected distribution network has the biggest benefit of operational flexibility and therefore improved customer service quality KPIs such as SAIF, CAID, SAID, etc.
12	Is the local technology provided to the Project sustainable and compatible with the Finnish technology?	Yes. With all the major equipment being manufactured in line with European (IEC) standards
13	Are the technical concepts appropriate for distribution system; have the specific needs been addressed in regard to the technical scope, operations and training needs?	yes
14	Interface to other hierarchy levels; has the compatibility with the other control systems been checked and have the costs of interfacing been taken into account?	One of the major requirement of the project was seamless interfacing with the existing systems. The delivered protection & control system (SAS) complied with IEC 61850 and IEC 60870-5-104 protocols which ensured full interoperability with the National Control Centre's SCADA/EMS system.
15	Is the proposed investment a cost-efficient option for solving the initial problem and if other options have been studied.	The solution is the most cost efficient option after studies were done and all factors considered.
16	What are the approximated total costs of ownership (TCO) of the system and institutions' capability to cover these costs.	The total contract price was EUR 20,737,716.68 and USD 4,026,110.69 and KPLC is able to keep the station running and cover all the operational costs.
17	How effective was the project's environmental and social risks mitigation plan?	All the NEMA's environment requirements were complied with fully.
18	Were there any grievances that were received during either the construction phase or operational phase of the sub-station?	None
19	To what extent were the project's grievances registered? How were these addressed?	N/A

20	How effective were the stakeholder consultations carried out for the project?	All stakeholders were included in all the stages of project implementation.
<b>C: Questions related to efficiency</b>		
1	How efficiently were available resources transformed into intended results in terms of quantity, quality and time?	Being a turnkey project, the contract was awarded to ABB Finland, a very experienced company in power sector projects. Resources were efficiently mobilized with optimized timelines.
2	Can the project be deemed to have been good value for money?	Absolutely.
3	The project was implemented as a 'turn-key delivery'; how did this contract modality affect the effectiveness and efficiency?	The turnkey delivery modality made it simple for the KPLC's project implementation team to manage the project efficiently by dealing with only one contractor.
4	The appraisal report mentions that Kenya has had a bad record of corruption. Were there any anti-corruption measures taken in the project?	The integrity set standards were very high with strict anti-corruption measures put in place.
5	Any good practices or lessons to learn	Yes. Project management principles for optimized projection execution.
6	What were the key success factors/bottle necks that contributed/constrained implementation (planning, procurement, implementation, risk management, monitoring, follow-up after close of project)?	<p>Key success factors:</p> <ol style="list-style-type: none"> <li>Good specs</li> <li>Contractor's experienced manpower in terms of technical skills and project management</li> <li>Manufacturing and shipment smooth processes</li> <li>KPLC's effective participation &amp; facilitation at all the stages of the project</li> <li>Efficient invoice payment process</li> <li>Proper SHE administration</li> </ol> <p>Few bottlenecks</p> <ol style="list-style-type: none"> <li>Working space constraints - working inside the existing station</li> <li>Working inside a live station environment required strict safety measures which sometimes would delay some activities like civil works excavations</li> <li>Required shutdowns' delay – some shutdowns could only be possible on low demand days like Sundays</li> <li></li> </ol>
7	What was the role/contribution of the different actors?	<p>Project parties:</p> <ul style="list-style-type: none"> <li>Financing parties (GoK, Finn Gov., Nordea Bank, etc.)</li> <li>KPLC</li> <li>ABB and their sub-contractors &amp; suppliers</li> <li>Local authorities</li> </ul>
8	There was a 7-year gap between the project appraisal and the start of the project. What were the causes of this delay, are there any lessons to learn?	<p>Main reasons:</p> <ol style="list-style-type: none"> <li>Financing agreements closure</li> <li>Tendering process – the first bidding conducted in 2011 which was rejected on the basis of technology, which had specified outdoor GIS system which was not practically possible to implement. Decision was made to retender for full indoor GIS solution. The tender was done in 2012 and contract was finally awarded to ABB Oy of Finland.</li> </ol>

9	How were the environmental and health & safety standards put into practice in project implementation?	The detailed health & safety code was displayed clearly at site and safety daily briefing ('tool box' meeting) was done before starting the day's works. ABB's & KPLC's SHE functions performed regular Health & Safety audits during project execution.
<b>D: Questions related to impact</b>		
1	How well did the project succeed in achieving its overall objective to improve the quality of life of the beneficiary population, contribute to economic development and support the delivery of public services?	Very well
<b>Project impacts at different levels</b>		
3	Clients of KLPC (residential, commercial, industrial, public services) within the substation service area	Stable supply
4	What is the level of improvement of the electricity supply?	Reduced outages – over 90% reduction of outages during the last five years after commissioning compared with the five years before.
5	What can be said about the socio-economic impacts achieved through the provision of additional electricity services (based on selected socio-economic indicators as i.e., job creation, new business, etc.)?	Improved capacity & quality of supply directly impacts on all social economic indicators.
6	KPLC staff: were there improvements to workers' health and safety, work stability, number of jobs created, other?	KPLC's staff benefited with skills transfer and KPLC's business benefited with reduced operational costs including reduced work force demand due to the low maintenance requirements of the commissioned GIS solution.
7	Was there any project affected people, i.e., people living close to the sub-station?	None – the project was an upgrade of the existing station
8	Did the project cause negative impacts in the quality of living environment, and to what level?	None
9	In case of negative impacts ( <u>environmental and social</u> ), were there any mitigation or compensation schemes?	N/A
10	What other noticeable impact did the project have (intended/unintended, positive/negative), particular in terms of human rights, gender equality, inequalities and environmental sustainability?	None
11	Did the positive project impacts reach marginalized or vulnerable communities?	Not directly
12	To what extent did the project consider the needs of potentially marginalised persons living in the neighbourhood of Juja, in terms of	During the implementation the local people were given priority in terms of considerations for job opportunities, especially for unskilled labor

	considerations for job opportunities, social inclusion into the project, etc.?	
13	To what extent did they benefit from improved electricity supply?	High availability of power supply meant better estate lighting and therefore improved security in the neighborhoods.
14	Were there any unforeseen negative environmental and social consequences noted as a result of implementation of project activities?	None
<b>E: Questions related to sustainability</b>		
1	How sustainable are the results achieved in the project?	The delivered GIS solution has long life expectancy and therefore the project objectives are sustainable.
2	Have stakeholders in Kenya taken steps to ensure sustainability i.e., in budgeting or other processes?	KPLC has detailed maintenance plan complete with budget allocation
3	Are the project results still relevant and are the systems installed/other outputs of the project still in efficient and effective use?	The delivered station is running smoothly and the greater Nairobi supply is stable
4	Is the operation and maintenance capacity (technical, financial) of KLPC in adequate level to maintain and upgrade the investment?	Yes. Proper training was done during the project execution.
5	Is there an O&M plan, is it being implemented?	KPLC has detailed maintenance plan according to the manufacturers' guidelines complete with budget allocation
<b>F: Other</b>		
1	Has the Renewal of the Juja Road substation had benefits on other sector development projects? I.e., WB's Energy Sector Recovery Project?	Yes – Juja substation is electrically in the middle of the national transmission grid system, thus impacting on the entire country's power supply projects.
2	Do you see any synergies with the Finnish funded Turkana wind farm project (completed)?	N/A

**Table A2-3: Additional Questions Evaluation Matrix KPLC**

No.	Additional Evaluation Questions	Response by KPLC
<b>Technical/ Financial Aspects</b>		
1	Please provide Completion Certificate (25.06.2017) (Contractual 31.07.2017)	Completion Certificate:  KPO_CC_001.pdf
2	Please provide Operational Acceptance Certificate (21.01.2018)	Operational Acceptance Certificate:  KPO_OAC_001.pdf
3	Please provide pre-project substation basic layout	Combined pre & post-project substation basic layout:  CBT-008171 T1 E8102.pdf
4	Please provide post-project substation basic layout	Only post-project substation basic layout:  CBT-008171 T1 E8101.pdf
<b>Financial Details</b>		
1	Could you comment on the efficiency and responsiveness of KPLC on the complying with the schedule of payments?	KPLC complied fully with the contractual schedule of payments. This was one of the key success factors – timely invoice processing. Some sample invoicing logs are attached separately
<b>Environmental Aspects</b>		
1	Evaluation of the adequacy of the Environmental Impact Assessment (EIA), which was part of the feasibility study:	Topic discussed bilaterally with FCG’s Environmental and Social Specialist
2	It is understood that the EIA was conducted by KPLC. Please provide the document	Topic discussed bilaterally with FCG’s Environmental and Social Specialist
3	It is understood that the brief Environmental Screening and Assessment Report was conducted by KPLC. Please provide the document	Topic discussed bilaterally with FCG’s Environmental and Social Specialist
4	It is understood that the Stakeholder’s Consultation Report was conducted by KPLC. Please provide the document	Topic discussed bilaterally with FCG’s Environmental and Social Specialist
5	According to the guideline and terms of Kenya’s Environmental Management and Coordination Act (EMCA) 1999, Schedule 2: Was an Environmental License granted to the project? Please confirm	Topic discussed bilaterally with FCG’s Environmental and Social Specialist
6	Please provide a copy of the Environmental License	Topic discussed bilaterally with FCG’s Environmental and Social Specialist
7	What was the level of compliance that KPLC requested from ABB related to the EIA?	Topic discussed bilaterally with FCG’s Environmental and Social Specialist
8	Could you mention the impact mitigation actions conducted by Kenya Power and Light Company (KPLC)?	Topic discussed bilaterally with FCG’s Environmental and Social Specialist
9	Assessment of the project’s Grievance Redress Mechanism (GRM). Please provide a copy	Topic discussed bilaterally with FCG’s Environmental and Social Specialist

10	The Environmental Management Plan (EMP) is responsibility of the contractor (ABB), which shall be approved by the owner (KPLC). Please confirm	Topic discussed bilaterally with FCG's Environmental and Social Specialist
11	Did KPLC approve and supervise the execution of the EMP?	Topic discussed bilaterally with FCG's Environmental and Social Specialist
12	Please provide a copy of the approved EMP	Topic discussed bilaterally with FCG's Environmental and Social Specialist
13	Assessment of the implementation of the EMP, including whether funding was available for the implementation mitigation measures. Please elaborate	Topic discussed bilaterally with FCG's Environmental and Social Specialist
14	In-depth examination of potential environmental and social impacts post-implementation using selected key sources in Juja, and triangulating this with community consultations during the field visit to Juja on September 28	Topic discussed bilaterally with FCG's Environmental and Social Specialist
15	The Health and Safety (H&S) is responsibility of the contractor (ABB), which shall be approved by the owner (KPLC). Please confirm	Topic discussed bilaterally with FCG's Environmental and Social Specialist
16	Please provide a copy of the H&S as follows: a) Environmental Health and Safety (EHS) b) Occupational Health and Safety (OHS)	Topic discussed bilaterally with FCG's Environmental and Social Specialist
17	Did KPLC approve/supervise the execution of the H&S?	Topic discussed bilaterally with FCG's Environmental and Social Specialist
18	De-briefing meeting with KPLC's E&S specialist supporting the project (vide communication through Mr. Godfrey Ticha)	Topic discussed bilaterally with FCG's Environmental and Social Specialist
19	<u>Other</u> : Discussions with NEMA's field office in Kiambu and the NEMA HQs to see if there were any unforeseen negative impacts that have been registered	Topic discussed bilaterally with FCG's Environmental and Social Specialist
<b>Finnish Visibility/ Development Context</b>		
1	Could you mention if the Finnish content of the project (funding and technology) was well represented?	The minimum Finnish content of the project was 50% was met: The contractor was ABB – Finland, and the following key project equipment were manufactured in Finland: <ul style="list-style-type: none"> <li>• Power transformers</li> <li>• Protection and Control Systems</li> </ul> While: <ul style="list-style-type: none"> <li>• GIS was manufactured in ABB's factory in Germany</li> <li>• Telecommunication system was manufactured in ABB's factory in Switzerland</li> </ul> The key personnel (project manager, site manager & lead engineers) were from ABB Finland.
2	How KPLC perceived the cooperation between Finnish and Kenyan counterparts?	The cooperation was very cordial



### Appendix 3: List of documents reviewed

**Table A3-1: List of Documents Reviewed**

No.	Document	Content
<b>Documentation Provided Internally</b>		
1	FCG PIF Kenya evaluation Tech tender 20220816	Proposal submitted to the MFA for advisory services for the final evaluation of the Juja Road Substation Refurbishment/Modernization Project prepared by FCG.
2	Hitachi-ABB Power Grids Finland (2021). Juja Road and Ruaraka Project Presentation to the MFA 1.10.2021.	Summary presentation of the implemented project
3	Hitachi-ABB Power Grids Finland (2021). Juja Road and Ruaraka Project. Status Report	Status Report on the implementation of the Juja Road Substation Refurbishment/Modernization Project.
4	Hitachi-ABB Power Grids Finland (2021). Juja Road and Ruaraka Project. Final Report	Final Status Report on the implementation of the Juja Road Substation Refurbishment/Modernization Project.
5	MFA 2010_CC Feasibility Study Guidelines	Technical Guidelines for Project Development.
6	MFA 2013_TOR for procurement review	TOR for evaluation of proposals of the Juja Road Substation Refurbishment/Modernization Project
7	Niras (2013). Evaluation of Bidding Documents	Bid Evaluation Report of the Juja Road Substation Refurbishment/Modernization Project.
8	Ministry of Foreign Affairs Finland (2007). Juja Road Substation Renewal Project. Appraisal Report.	Concept proof for approval of the Juja Road Substation Refurbishment/Modernization Project.
9	Ministry of Foreign Affairs Finland (2007). Ramboll. Juja Road Substation Renewal Project. Post-Appraisal Report	Concept proof for approval of the Juja Road Substation Refurbishment/Modernization Project.
10	Ministry of Foreign Affairs Finland (2007). Juja Road Substation Renewal Project. Appraisal Report	Technical baseline of the Juja Road Substation Refurbishment/Modernization Project
11	Aberdare Engineering Limited (2005). Juja Road Substation Renewal Project. Feasibility Study.	Technical baseline of the Juja Road Substation Refurbishment/Modernization Project
<b>External Documents</b>		
12	United Nations Development Programme Evaluation Guidelines, Independent Evaluation Office of UNDP, New York, June 2021	Description of evaluation instruments applied to international technical cooperation for development
13	OECD (Evaluation of Development Programmes, and DAC (Criteria for Evaluating Development Assistance). <a href="http://www.oecd.org/dac/evaluation/daccriteriaforevaluatingdevelopmentassistance.htm">http://www.oecd.org/dac/evaluation/daccriteriaforevaluatingdevelopmentassistance.htm</a>	Description of evaluation instruments applied to international technical cooperation for development
14	Kenya - Energy Sector Recovery Project (English). Washington, D.C. : World Bank Group. <a href="https://documents.worldbank.org/curated/en/231491468753301505/Kenya-Energy-Sector-Recovery-Project">https://documents.worldbank.org/curated/en/231491468753301505/Kenya-Energy-Sector-Recovery-Project</a>	Description of the Power Sector in Kenya
15	The World Bank (2004). Kenya-Energy Sector Recovery Project (English). Washington, D.C. : World Bank Group. <a href="https://documents.worldbank.org/curated/en/231491468753301505/Kenya-Energy-Sector-Recovery-Project">https://documents.worldbank.org/curated/en/231491468753301505/Kenya-Energy-Sector-Recovery-Project</a>	Description of the Power Sector in Kenya
16	Godinho, Catrina; Eberhard, Anton. 2019. Learning from Power Sector Reform Experiences: The Case of	Description of the Power Sector in Kenya

	Kenya. Policy Research Working Paper;No. 8819. World Bank, Washington, DC. World Bank. <a href="https://openknowledge.worldbank.org/handle/10986/31561">https://openknowledge.worldbank.org/handle/10986/31561</a> . License: CC BY 3.0 IGO.	
17	Team Technologies, Middleburg, Virginia; The logframe handbook : a logical framework approach to project cycle management (English). Washington, D.C. : World Bank Group. <a href="https://documents.worldbank.org/curated/en/783001468134383368/The-logframe-handbook-a-logical-framework-approach-to-project-cycle-management">https://documents.worldbank.org/curated/en/783001468134383368/The-logframe-handbook-a-logical-framework-approach-to-project-cycle-management</a>	Guideline on the Logical Framework Approach
18	Government of Kenya. 2017. Sessional Paper No. 5 of 2016 on National Climate Change Framework Policy. Published by the Ministry of Environment and Forestry. Accessed on September 8, 2022, at <a href="http://www.environment.go.ke/wp-content/uploads/2018/08/Climate-Change-Framework-PolicyMay2017.pdf">http://www.environment.go.ke/wp-content/uploads/2018/08/Climate-Change-Framework-PolicyMay2017.pdf</a>	Project evaluation data source
19	Government of Kenya. 2020. National Climate Change Action Plan 2018 – 2022. Published by the Ministry of Environment and Forestry, Kenya. Accessed on September 7, 2022, at <a href="http://www.environment.go.ke/wp-content/uploads/2020/03/NCCAP_2018-2022_ExecutiveSummary-Compressed-1.pdf">http://www.environment.go.ke/wp-content/uploads/2020/03/NCCAP_2018-2022_ExecutiveSummary-Compressed-1.pdf</a>	Project evaluation data source
20	Government of Kenya. 2021. Kenya's Updated Nationally Determined Contribution (NDC) and JCM Activities. Communication from Ministry of Environment and Forestry to UNFCCC. World Bank. 2022.	Project evaluation data source
21	Population living in slums – Kenya. Accessed on September 8, 2022, at <a href="https://data.worldbank.org/indicator/EN.POP.SLUM.UR.ZS?locations=KE">https://data.worldbank.org/indicator/EN.POP.SLUM.UR.ZS?locations=KE</a>	Project evaluation data source
22	Government of Kenya. 2004. Sessional Paper No. 4 of 2004 on Energy. Published by the Ministry of Energy. Retrieved from: <a href="https://repository.kippira.or.ke/handle/123456789/1371">https://repository.kippira.or.ke/handle/123456789/1371</a>	Project evaluation data source
23	Bidding Documents: (i) Bid Form; (ii) Covering Letter Form; (iii) Notes and Clarifications Section (a comprehensive technical description of the Project scope); (iv) Price Schedules Form; (v) Time Schedule Form; (vi) Bid Security Form; (vii) Power of Attorney Template; (viii) Eligibility and Qualifications Form; (ix) Subcontractors Form.	Forms and technical information used for bidding of the Juja Road Substation. Provided by Hitachi-ABB Finland Project evaluation data source
24	Technical schematics of the Juja Road Substation (before and after the project)	Technical Drawings. Provided by KPLC Project evaluation data source
25	KPLC, 2018. Certificate of Acceptance	Official Document. Provided by KPLC Project evaluation data source
26	KPLC, 2018. Certificate of Operation	Official Document. Provided by KPLC Project evaluation data source

ABB: Asea Brown and Boveri, DAC: Development Assistance Committee, EPC: Engineering Procurement Construction, FCG: Finnish Consulting Group, KPLC: Kenya Power and Lighting, MFA: Ministry of Foreign Affairs, OECD: Organization for Economic Cooperation and Development, PIF: Public Sector Investment Facility, UNDP: United Nations Development Programme

#### Appendix 4: List of Persons Interviewed

**Table A4-1: List of Persons Interviewed**

No.	Participants	Date
<b>Inception Phase, Home Based</b>		
1	FCG/MFA/Embassy of Finland in Kenya. Kick-off (video conference) Mr. Oskar Kass, Team Leader, Team for Private Sector Instruments, MFA of Finland Ms. Hannele Tikkanen, Desk Officer, Team for Private Sector Instruments, MFA of Finland Ms. Henna-Riikka Pihlapuro, Desk Officer, Team for Private Sector Instruments, MFA of Finland Mr. Otto Kivinen, Deputy Head of Mission, Embassy of Finland in Kenya Ms. Sini Pellinen (FCG/Manager Natural Resources) Mr. Paul Stefan Hattle (Energy Expert) Mr. Abdirahman Dubow (Environmental/Social Expert)	24 <sup>th</sup> August 2022
2	FCG/Hitachi-ABB (video conference): Mr. Ari Kattelus (Hitachi-ABB/Project Manager) Mr. Frank Finskas (Hitachi-ABB/Project Manager) Ms. Sini Pellinen (FCG/Manager Natural Resources) Mr. Paul Stefan Hattle (Energy Expert)	31 August 2022
<b>Field Mission to Nairobi: 26-29 September 2022</b>		
3	FCG/KPLC, Administration Mrs. Catherine Gachau (KPLC/ Administrative Assistant General Manager)	26 September 2022
4	FCG/KPLC, Management Office Mr. Kennedy Owino (KPLC/Acting General Manager) Mr. Godfrey Ticha (KPLC/Operations Manager Juja Road Substation) Mr. Paul Stefan Hattle (Energy Expert) Mr. Abdirahman Dubow (Environmental/Social Expert)	27 September 2022
5	FCG/KPLC: Site visit to Juja Road Substation Project Mr. Godfrey Ticha (KPLC/Operations Manager Juja Road Substation) Mr. Paul Stefan Hattle (Energy Expert) Mr. Abdirahman Dubow (Environmental/Social Expert)	28 September 2022
6	FCG/European Investment Bank (EIB) Mr. Kiragu Mugwe (EIB/ Energy Specialist) Mr. Abdirahman Dubow (Environmental/Social Expert)	29 September 2022
7	FCG/Embassy of Finland (EOF) Mr. Otto Kivinen (EOI/Deputy Head of Mission, Embassy of Finland) Mr. Matts Weurlander (EOF/Counsellor, Skills Development and Job Creation) Mr. Abdirahman Dubow (Environmental/Social Expert)	29 September 2022
8	FCG/KPLC, Financial Department Mr. Eric Abila (KPLC/ Project Accountant) Mr. Paul Stefan Hattle (Energy Expert)	29 September 2022
9	FCG/KPLC, Mission Wrap-up Mr. Godfrey Ticha (KPLC/Operations Manager Juja Road Substation) Mr. Paul Stefan Hattle (Energy Expert)	29 September 2022
<b>Evaluation Report Preparation Phase</b>		
10	FCG/Ministry for Foreign Affairs (MFA) of Finland Mr. Ramses Malaty (MFA/Director Unit Administrative and Legal Development Cooperation; during 2016-2020 Deputy Head of Mission, Embassy of Finland in Kenya) Ms. Sini Pellinen (FCG/Manager Natural Resources)	17 October 2022
11	FCG/FINNVERA Mr. Mika Relander (senior adviser, Finnvera) Ms. Outi Homanen (senior adviser, Finnvera)	18 October 2022

	Ms. Sini Pellinen (FCG/Manager Natural Resources)	
12	FCG/Embassy of Finland in Mozambique Ms. Eeva Alarcon (Deputy Head of Mission, Embassy of Finland in Mozambique; during 2012-2015 Deputy Head of Mission, Embassy of Finland in Kenya ) Ms. Sini Pellinen (FCG/Manager Natural Resources)	21 October 2022

## Appendix 5: Interview Check List

**Table A5-1: Interview Check List**

No.	Evaluation Questions	Results
	<b>Relevance</b>	<b>Data Collection and Guidelines</b>
1	Was the project relevant to electricity service in Nairobi area and the local populations that were to benefit from the project?	<p><b>Evaluation Topics:</b>  <b>(i) Relevance; (ii) Effectiveness; (iii) Efficiency; (iv) Impact; (v) Sustainability; (vi) Coordination, Complementarity, Coherence, Aid Effectiveness; and (vii) Others.</b></p> <p><b>Main data collection:</b></p> <p>a) video conferences with Ministry of Foreign Affairs (MFA), Finland; Embassy of Finland (EOF), and Hitachi-ABB.</p> <p>b) Face-to-face interviews with Kenya Power and Lighting Company (KPLC) and field visit to the site of KPLC's Juja Road Substation.</p> <p>c) Face-to-face interviews with EOF and European Investment Bank (EIB).</p> <p>d) Informal interviews with project beneficiaries helped to collect data.</p>
2	Evaluation question 2: Did the project contribute to Kenyan developmental goals? Was the project in line with Finland's development policy objectives and global development goals?	
3	How did the project contribute to Kenya's climate change mitigation and adaptation goals? What was its contribution to Finland's development policy goals related to climate change mitigation and adaptation?	
	<b>Effectiveness</b>	
4	To what extent did the project achieve its immediate objective of significantly improving the supply of electric power to Nairobi area and surroundings, hence improving the services to local households and communities?	
5	Did the project achieve the targeted increase in electricity supply? To what extent did the reliability of electricity supply improve? Did it contribute to increased electricity coverage (new power connections)?	
6	What were the key success factors or bottle necks that contributed to the project either achieving or falling short of its objectives? What was the role/contribution of the different actors (project owner, contractor and other stakeholders including the MFA)?	
	<b>Efficiency</b>	
7	How efficiently were available resources transformed into intended results in terms of quantity, quality and time? Can the project be deemed to have been good value for money?	
8	The project was implemented as a 'turn-key delivery'; how did this contract modality affect the effectiveness and efficiency?	
9	Appraisal report mentions that Kenya has had a bad record of corruption. Were there any anti-corruption measures taken in the project? Any good practices or lessons to learn?	
10	What were the key success factors/bottle necks that contributed/constrained implementation (planning, procurement, implementation, risk management, monitoring, follow-up after close of project)? What was the role/contribution of the different actors?	
11	There was a 7 year gap between the project appraisal and the start of the project. What were the causes of this delay, are there any lessons to learn?	
12	How were the environmental and health & safety standards put into practice in project implementation?	

Impact	
13	How well did the project succeed in achieving its overall objective to improve the quality of life of the beneficiary population, contribute to economic development and support the delivery of public services?
14	What are the project impacts in different levels: 1) Clients of KLPC; Residential, commercial, industrial, public services within the Sub-station service area; 2) KPLC staff; 3) project affected people?
15	What other noticeable impact did the project have (intended/unintended, positive/negative), particular in terms of human rights, gender equality, inequalities and environmental sustainability?
16	Did the positive project impacts reach marginalized or vulnerable communities? I.e. to what extent did they benefit from improved electricity supply?
Sustainability	
17	How sustainable are the results achieved in the project? Have stakeholders in Kenya taken steps to ensure sustainability e.g. in budgeting or other processes? Are the project results still relevant and are the systems installed/other outputs of the project still in efficient and effective use?
18	Is the operation and maintenance capacity (technical, financial) of KLPC in adequate level to maintain and upgrade the investment? Is there an O&M plan, is it being implemented?
Coordination, Complementarity, Coherence, Aid Effectiveness	
19	How were other programs and cooperation relevant to the project taken into account?
20	How well did the project promote ownership, alignment, harmonization, management for development results and mutual accountability?
21	Were there contradictions with other policy areas and how were they handled? How did the project impact debt sustainability of Kenya?
Other	
22	Did the project open up new business for the Finnish companies in Kenya or to other emerging markets? Was the project part of a strategy by the companies to expand operations in developing countries?
23	How did the project contribute more broadly to cooperation and relations between Finland and Kenya? Were there synergies with other Finnish cooperation in the region, such as the Lake Turkana wind park (funded by Finnfund)?
24	How was the project viewed by local ministries and did it meet their objectives?

**Documentation:**

e) It was provided by the MFA; Hitachi-ABB, and KPLC.

f) Publicly available documentation from Development Partners about Kenya’s power sector aspects, as governance, institutions, and issues/barriers.

**Additional Questions:**

g) The interview check-list was completed with additional questions, which helped to deep-dive the rationale, and results of the evaluated Project.

## Appendix 6: Reconstructed Results Framework

**Table A6-1: Reconstructed Results Framework of the Juja Road Substation Renewal Project**

Results	Indicators	Baseline	Target	Means of verification	Assumptions
<b>Identified Impact</b> Contribution achieved of the power sector to national development goals	Social, economic, environment, and climate aspects improved (health, sanitation, education) [Unit: Numbers]; New and additional employment created [Unit: Numbers]; Residential, commercial, industrial clients increased [Unit: Numbers]; Additional revenues collected [Unit: Euro equivalent per year]; National climate targets supported [Unit: tones of GHG equivalent per year]	None: No initial numbers as starting points available	None: No target numbers calculated	National statistics	Consistent and long-term national development goals; Consistent and long-term power sector governance; Power sector initiatives from development partners
<b>Identified Outcome</b> Reliable, stable, and secure Electricity Services delivered by Juja Road Substation	<u>Juja Road Substation (new):</u> Additional power capacity from 255 MVA to 360 MVA increased [Unit: MVA]; New power infrastructure delivering uninterrupted electricity services at 132/66/11 kV fully operational [Unit: kWh]	<u>Juja Road Substation (old):</u> Old operational statistical numbers as starting points	<u>Juja Road Substation (new):</u> None: No target numbers calculated	KPLC annual reports KPLC statistics; Reports from Development Partners,	Continuous training; Efficient and effective O&M; O&M budget available
<b>Identified Outputs</b> Juja Road Substation Renewed: Turn-Key modernized and refurbished at 132/66/11 kV levels fully operational	Juja Road Substation delivering stable and reliable electricity services [Unit: kWh per year]	Old inventory and bill of quantities	New inventory and bill of quantities	Approved technical designs; As build project documents available	Stable and professional project management capacity
<b>Activities</b>					
Funding	Estimated budget approved [Unit: Euro equivalent];		None:	Set of signed legal documents	Development policy Finland;

	Concessional loan, and grant approved	Initial budget calculated	No final budget targeted		Adequate sector governance framework in Kenya; Political willingness Kenya
Engineering- permitting	Design approved Permits granted	None:	None:	Set of approved documents	Selection committee with high technical capability
Procurement	Procurement documents approved-published; EPC selected and fielded.	None:	None:	Set of signed legal documents	Transparent process
Works and Services	Project documents approved; Power infrastructure implemented; Power infrastructure commissioned	Final inventory of old infrastructure	Final inventory of new infrastructure	Final certificate of acceptance	Institutional support Regular and smooth payment of financial obligations
Sustainability	Capacity development program conducted; Final O&M program approved	None: No initial Nr. of selected participants available	None: No final Nr. of trained participants expected.	List of trainees; Training syllabus	Stability of owner's personnel

Source: Energy Expert Estimates based on Public-Available Data

#### Narrative<sup>36</sup>:

- One-impact statement: Ultimate long-term benefits for target beneficiaries with indicators able to measure long-term impacts of the intervention
- One-outcome statement: Changes the project intends to accomplish by the end of the project implementation with indicators able to measure concrete changes resulted from the intervention in quantitative and/or qualitative terms
- Set of outputs: Tangible and intangible works and services delivered by the project with indicators able to define quality and quantity of deliverables of the intervention.
- Baseline: Initial starting indicators As the Results Framework has been ex-post reconstructed the original baseline is unknown
- Target: Final indicators to be achieved. As the Results Framework has been ex-post reconstructed the original targets are unknown

<sup>36</sup> Ministry of Foreign Affairs, Finland. <https://um.fi/evaluation-of-development-cooperation>