ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT SUMMARY

Project Title: Addis Ababa Transmission and Distribution System Rehabilitation and Upgrading Project (AATDRUP)

Project Number: P-ET-FA0 - 013
Country: ETHIOPIA
Department/Division: RDGE/RDGE1
Project Category: Category 1

1. Introduction

In February 2014, Ethiopian Electric Power (EEP) commissioned the production of Addis Ababa Distribution Master Plan (AADMP) for the development of the electricity distribution network over the next 20 years for Addis Ababa city and its environs. The Master Plan identified the refurbishment, upgrading and expansion of the distribution network required to meet the rapidly growing demand, whilst ensuring acceptable quality and reliability of supply of electricity. The Addis Ababa Distribution Master Plan was finalized in September 2015. As part of the study, a Strategic Environmental and Social Assessment (SESA), Environmental and Social Management Framework (ESMF) and Resettlement Action Framework (RAF) were finalized in September 2015.

The Plan has now evolved into the Addis Ababa Transmission and Distribution Network Short and Medium Term Rehabilitation and Upgrading Project (AATD RU P). The proposed Project involves the short- and medium-term rehabilitation and upgrading of transmission and distribution network components and their associated infrastructures in the Addis Ababa city and its environs where the major load centre and high growth of electricity consumption is dominant (approximately 60% of overall country demand). The Project also includes a component for the improvement of the distribution network nearby urban towns. The Project also includes a component for the improvement of the distribution network nearby urban towns. The Project is co-financed by the Japan International Cooperation Agency.

An ESMP was prepared in July 2016 to address the anticipated environmental and social impacts associated with the AATDRUP which are not considered to require an individual Environmental and Social Impact Assessment (ESIA), that is for those considered to be Schedule 2 subprojects according to national EIA guidelines and Category 2 projects according to AfDB Environmental and Social Assessment Procedures (ESAP, 2014). All the subprojects are expected to fall under Category 2, except for the Mekanisa-Gofa Transmission Line and Substations Upgrade subproject which involves erecting a 1.9 km long 132kV overhead transmission line and will cause some physical and economic displacement. In line with the Bank’s Integrated Safeguards System (ISS) and the Environmental and Social Assessment Procedures (ESAP), power transmission projects involving overhead transmission lines of more than 110 kV and projects that affect more than 200 people qualify as Category 1 projects. As a result, the AATDRUP has been categorised as Category 1. Nevertheless, the Ministry of Water, Irrigation and Electricity (MOWIE) requires screening to be undertaken for each individual subproject, and based on the outcome, an ESIA or ESMP will be prepared accordingly. An ESIA and RAP have been prepared for the Mekanisa-Gofa subproject, for which environmental clearance was issued by MOWIE in November 2016.

2. Policy, Legal and Administrative Framework

Policy and Legal Framework

The Constitution of the Federal Democratic Republic of Ethiopia (FDRE), issued on 21 August 1995, forms the fundamental basis for development and enhancement of all laws and specific legislative instruments governing environmental matters in Ethiopia. This sets out a framework as regards protection of the environment and of the health of Ethiopian people. It also defines the basis of land ownership and the rights of land users. The Environmental Policy of Ethiopia (EPE, April 1997) aims to improve and
enhance the health and quality of life of all Ethiopians, and to promote sustainable social and economic development through the sound management and use of natural, human-made and cultural resources and the environment as a whole, so as to meet the needs of the present generation without compromising the ability of future generations to meet their own needs. Other relevant polices are the Energy, Cultural, Biodiversity and Health Policies. Key proclamations which serve to implement the Constitution in the context of this Project include:

- Proclamation on Institutional Arrangement for Environmental Protection No. 295/2002;
- Environmental Impact Assessment Proclamation No. 299/2002;
- Proclamation on Environmental Pollution Control No. 300/2002;
- Expropriation of Land Holdings for Public Purposes and Payment of Compensation Proclamation No. 455/2005;
- The Rural Land Administration and Land Use Proclamation No. 456/200;
- Solid Waste Management Proclamation No. 513/2007;
- Proclamation on Research and Conservation of Cultural Heritage No. 209/2000;
- Proclamation for the Convention on Climate Change No. 97/1994;

Directive No. 2/2008 issued to determine the categories of projects subject to the Environmental Impact Assessment Proclamation No. 299/2002 provides a list of projects requiring full ESIAs. Transmission and distribution is not listed in this directive, although Appendix 1 of the EPA EIA Guidelines (2000) list high power transmission lines as requiring a full ESIA. Projects which may have some environmental and social impacts, but are not listed in the aforementioned, require environmental and social management plans to be prepared.

The rights and obligations of the Environmental Protection Authority (EPA) transferred to the newly established Ministry of Environment, Forest and Climate Change (MOEFCC) by Proclamation No. 803/2013, 29th July 2013). MOEFCC is mandated to coordinate measures to ensure that the environment objectives provided under the constitution and the basic principles set out in the environmental policy of Ethiopia are realized.

The Project has been prepared in compliance with AfDB safeguard procedures and guidance, as set out in the Bank’s Integrated Safeguards System (2013), and its interrelated components, namely: the Integrated Safeguards System Policy Statement and Operational Safeguards (2013)), the Environmental and Social Assessment Procedures (ESAP, 2014) and the Integrated Environmental and Social Impact Assessment Guidelines (IESIA, 2003).

The Project triggers the following Operational Safeguards: OS 1: Environmental and Social Assessment because the investment will potentially result in various environmental and social risks and impacts which need to be analysed and addressed; OS 2: Involuntary Resettlement: Land Acquisition, Population Displacement and Compensation since the Project could potentially cause the physical relocation of one household, and economic displacement of more than 200 persons; OS 4: Pollution prevention and control, hazardous materials and resource efficiency given that hazardous waste will be generated by the Project; and OS 5: Labor Conditions, Health and Safety as workers and surrounding communities will be exposed to accidents and occupational health and safety risks during both construction and operation.

Ethiopia is also a signatory to a number of multilateral environmental agreements; the most relevant to this Project include: the Stockholm Convention on Persistent Organic Pollutants, Convention Concerning the Protection of the World Cultural and Natural Heritage, African Convention on the Conservation of Nature and Natural Resources, Convention on Biological Diversity, the United Nations Framework Convention on Climate Change, and the Vienna Convention on the Protection of the Ozone Layer and its Montreal Protocol.
Administrative Framework

Ethiopian Electric Power Company (EEPCo) was the sole public utility responsible for generation, transmission and distribution of electric power throughout Ethiopia. MOWIE has recently split EEPCo into two new organizations, EEP and Ethiopian Electric Utility (EEU). MOWIE is the regulatory body for the energy sector. MOWIE’s Environment and Climate Change Directorate (formerly Environmental Impact Assessment and Social Development Office) is responsible for evaluating and approving ESIA, ESMP and RAP study reports for electrical infrastructure projects as well as for providing environmental approval which must be obtained prior to the commencement of project implementation. Thus the overall responsibility for monitoring environmental and social compliance for the Project lies with the MOWIE. They also follow up on projects to ensure that environmental and social mitigations have been implemented.

EEP is the Proponent for the Project and has extensive experience in the implementation of similar projects. The Environment and Social (E&S) Office which sits within EEP is responsible for the integration of environment and social matters within electric power development. It will undertake the monitoring and evaluation of the Project against the ESIA, ESMP and RAP documents. Ethiopian Electric Utility (EEU) will operate and maintain the Project once commissioned and will manage the supply of power from the Project to consumers. EEU’s in house Environmental, Health, Safety, Quality and Performance Excellence Unit (EHSQ & PE) will be responsible for ensuring the environmental and social compliance with respect to the future operation and maintenance of the Project.

3. Project Description and Justification

Project Description

The Project comprises the rehabilitation and upgrading (short & medium term) of transmission and distribution network components covering 26 sites that are packaged into five lots (I-V). The sixth component covers programme supervision and management as well as capacity building.

Typical rehabilitation subprojects comprise one or a combination of the following:
- Feeder reconfiguration;
- Feeder refurbishment and Upgrades;
- Installation of new feeders;
- Substation rehabilitation; and
- Installation of new primary substations (generally package plants).

Typical short and medium term subprojects comprise one or a combination of the following:
- Feeder Rehabilitation and Upgrades;
- New Feeders (including underground cables within the road reserve);
- Substation Upgrades; and
- New Substations.

Thus Project includes the following packages:

I. Urgent Rehabilitation Projects (Distribution): Rehabilitation of 280 km of MV lines, replace 280 distribution Transformers and Installation of four 33/15 kV primary substations;
II. Short and Medium Terms Projects (Distribution network): Construction of 265km medium voltage lines, installation of 22 distribution transformers and one 45/33/15kV and nine 33/15 kV primary substations;
III. Short and Medium Terms Projects (Substation, Transmission and Upgrading of ADC Substation): This comprises: a) Upgrading of existing eleven substations and construction of one double circuit 132 kV line and 3.8km 132kV double circuit underground line from Sealite Mihret Church to Weregenu substation and b) Approximately 16km new double circuit 132kV underground line between Addis Centre and Kaliti-I and a new 132/33/15kV GIS substation;
IV. Distribution, Installation of Distribution System Supervisory Control and Data Acquisition (SCADA) and telecommunication system;

V. Distribution Network Rehabilitation Program Pilot Project for selected areas (Phase II): Rehabilitation of 215km of Medium Voltage lines, 512 distribution transformers and 500km of Low voltage lines; and

VI. Project Supervision and Management and Capacity Building Program

Packages I-VI are included under Phase I financing.

Components under the various packages are summarised in Table 1 below:

<table>
<thead>
<tr>
<th>Component</th>
<th>Package I</th>
<th>Package II</th>
<th>Package III</th>
<th>Package V</th>
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<tbody>
<tr>
<td>HV Transmission lines overhead &amp; underground (km)</td>
<td></td>
<td></td>
<td>19.8</td>
<td></td>
</tr>
<tr>
<td>HV Substations Upgrade/Rehabilitation</td>
<td></td>
<td></td>
<td>11</td>
<td>-</td>
</tr>
<tr>
<td>New HV Substation</td>
<td></td>
<td></td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Primary substations (Medium Voltage)</td>
<td>4</td>
<td>10</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Installation of Distribution Transformers (No.)</td>
<td>280</td>
<td>22</td>
<td>512</td>
<td></td>
</tr>
<tr>
<td>Feeder Rehabilitation (km)</td>
<td>280</td>
<td>-</td>
<td>-</td>
<td>215</td>
</tr>
<tr>
<td>- MV</td>
<td></td>
<td></td>
<td></td>
<td>500</td>
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<tr>
<td>- LV</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>New Feeder (km)</td>
<td></td>
<td>265</td>
<td>-</td>
<td>-</td>
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<tr>
<td>- MV</td>
<td></td>
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<td>- LV</td>
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The total project cost is estimated at USD 405 million for Phase I and II development. The current tentative Phase I financing is estimated at USD 199.84 million, of which the AfDB will finance USD 109.02 million and JICA will finance 90.65 million. The Government of Ethiopia’s contribution USD 167,646.

**Justification**

The overall goal of the Government of Ethiopia’s (GOE) Growth & Transformation Plan (GTP-II 2015/16-2019/20) is Accelerated and Sustainable Socio Economic Development to End Poverty. The plan aims to achieve an annual average real GDP growth rate of 11 percent within stable macroeconomic environment while at the same time pursuing aggressive measures towards rapid industrialization and structural transformation. In order to achieve this goal, one of the key objectives of the GTP-II to increase the country’s generating capacity from 4180 MW in 2016 to 17,208 MW by 2020. In this respect the GOE has mobilized resources for implementing three hydroelectric projects (Gibe III (1,870 MW), the Renaissance Dam (6,000 MW) and the Genale Dawa-III (250 MW)), as well as a number of other renewable energy generating projects involving IPPs. There is therefore a need now to transport that generated power from generation sources to distribute it to industrial and urban load centers and also to increase the customer base of the power utility by creating opportunities to improve connectivity of the pent-up demand for electricity due to prevailing constraints in the transmission and distribution network.

The Project will therefore contribute to supporting Ethiopia in meeting its medium-term growth target. It aims to increase the customer base from 2.41 million in 2015/16 to 6.95 million by 2020 through the development of an adequate transmission and distribution system for power transfer to various parts of the country along with a focus on development of adequate infrastructure in the cites, commercial and industrial private businesses, as well as enhancing connectivity of urban customers.
The Project is aligned with the Bank’s Country Strategy Paper (2016-2020) which is anchored on two pillars, namely: (i) infrastructure development and (ii) promoting economic governance, with emphasis on facilitating effective and efficient delivery of basic services and a business enabling environment for private sector development. In this regard, the intervention will support the GoE to deliver an adequate and reliable electricity supply for industrialisation, domestic use and regional markets, through expanding and strengthening the transmission and distribution networks along the major corridors. Thus it will contribute to improved access to energy, mitigate the growing power demand in the cities and ensure quality of the electricity supply to urban areas, thereby supporting economic development. The Project also complements the Bank’s Ten-Year Strategy (TYS) and three of the High 5s: Light up and power Africa, industrialise Africa and improve the quality of life for the people of Africa.

4. Description of the Project Environment

Project Area: The Project area comprises the city of Addis Ababa and an approximate 50km radius around the city as depicted in Figure 1 below. The area straddles administrative boundaries, and includes the entire administrative area of Addis Ababa, comprising ten sub-cities and parts of the surrounding region of Oromiya.

Figure 1: AATDRUP Project Area

Demographic Characteristics: Addis Ababa city has an official total population of over 3 million inhabitants. Population density ranges from approximately 32,000 inhabitants per km² (Addis Ketema Sub-City) to approximately 1500 inhabitants/km² (Akaki Kaliti). Almost all of the population within Addis Ababa city are classed as urban dwellers. There is a high rate of influx of settlers into the city from the surrounding regions and other parts of Ethiopia. The total population in the Addis the surrounding area located in Oromiya Region is estimated at about 1.3 million of which 79% are located within a rural
environment. This area is still relatively densely populated with an average of 171 persons per km² compared to the national average of 59 persons per km².

Altitude, Climate and Rainfall: The altitude of the Project area ranges from approximately 1,950 to 2,900 m asl. The city is characterised by a subtropical highland climate, with temperature differences of up to 10°C, depending on the elevation. The city’s proximity to the equator means that temperatures do not fluctuate much during the year. Highest average temperatures (24 – 25°C) occur during February – May and lowest average temperatures occur during November – February (8 - 9°C). The wet season is from June to September, the highest rain falling in July/August. November – January are the driest months.

Physical Environment: Air quality in Addis Ababa has poor air quality, mainly due to the high levels of traffic and the use of old motor vehicles. While CO, NO2 and SO2 levels are found to be within WHO standards, PM2.5 concentration levels in the ambient air are higher than WHO guidelines for most of the city. Addis Ababa’s water comes from both river-fed reservoirs (mainly Gefersa, Legedadi and Dire) and ground groundwater sources (mainly the Akkai wellfield). Addis Ababa is considered to have a severely vulnerable water supply, in terms of water quantities and quality.

Natural Environment: The urbanization of Addis Ababa in conjunction with the high demand for agricultural land and firewood has profoundly altered both the vegetation and the landscape of the city. Ecological degradation, including deforestation and erosion is as such prevalent in this area. Fauna and flora: Due to the urbanization of Addis Ababa, and the pressure exerted by the demand of agricultural land in its outskirts, much of Addis’ original wildlife has been lost.

Waste Generation and Disposal: More than 200,000 tonnes of solid waste are collected each year by the municipal services, accounting for 80% of the waste produced. Waste which is not collected or treated is disposed of in open landfills. Sanitation provision in Addis Ababa is grossly deficient, with large amounts of faecal waste being discharged to the environment (mostly the tributaries of the Akkai) without treatment.

Land Use: In recent decades, there has been an intensive conversion of rural land for urban development including for residential and commercial uses, transportation infrastructure and facilities (airports and highways), industrial establishments and recreation areas. This is intensifying as a result of the implementation of the city and regional development plans and as a result of inward investment from overseas developers and investors. About 31% of Addis Ababa city is classified as a built up area and is the largest overall land usage type with a further 13% planned for mixed use expansion. Other land uses include agriculture (13%) and forested areas (23%). About 14% of the Project area is used for agriculture. Industry currently accounts for less than 3% of land take. In the area surrounding Addis Ababa, agricultural land (cultivated and planned) makes up over 67% of land take, forested land 9% and the built up area comprises only 6.5% of the total land area.

Economic Activities: In urban areas, the main economic support system is employment in trade (retail and wholesale) and industry, both self-employment and hired employment. In the surrounding rural area, the main stay of the economy is subsistence agriculture and livestock rearing, mainly using traditional rain fed, un-mechanised subsistence agriculture.

Education: Access to education has increased significantly in the last two decades. Addis Ababa City Administration and Oromia Regional State Governments are seeking to building capacity in the education sector by upgrading school facilities, improving the capabilities of teachers, placing an emphasis on science and technology and introducing ICT in all high schools.

Health: Acute upper respiratory infection is the most prevalent disease in Addis Ababa city (29.52% of the cases reported by government hospitals) in the reporting year 2012. In Oromia, the most prevalent disease is intestinal parasites at 14.3%, followed by a number of conditions and diseases including upper respiratory tract infection of 11.2%. In the Oromia region, there is an uneven distribution of health services, shortage of trained man-power and poor standards of hygiene and environmental sanitation, resulting in high prevalence of communicable and sexually transmitted diseases.
Housing: Housing is one of the most critical issues for Addis Ababa city. The SESA baseline study has shown that existing housing in the city can only accommodate 73% of the households and the remaining 27% are reported to be homeless.

Transport Infrastructure: Over 3,800 km of roads have been constructed in the city in just the past few years. The road and transport network is undergoing rapid expansion including new roads and road widening schemes and the implementation of new transportation systems. Rapid transit bus routes and a light rail system are being delivered to serve Addis Ababa city centre. A new rail line is being installed to connect Sebeta to Djibouti and there are plans to expand and move the international airport.

Energy Supply: Energy sources generally used in Addis Ababa and urban centres are electricity and fossil fuel (kerosene and diesel fuel) used for cooking and lighting. According to the 2007 CSA census, 98.12% of housing units have access to electricity for lighting with slight differences between sub-cities. The main energy sources outside Addis Ababa city are firewood, animal dung, charcoal, and agri-residue. Electricity supply is largely concentrated in the woreda towns.

5. Analysis of Project Alternatives

During the preparation of the Master Plan, the proposed Project components were considered with respect to minimizing the environmental and social impacts for a number of alternatives for the Rehabilitation and Short Term Expansion Plan, Low and Medium Voltage Refurbishment Programme, Medium and Long Term Expansion Plan, as well for Planning and Design Criteria. The recommended subprojects were identified on the basis of minimum cost and disruption to the network for maximum efficiency gain, as well as magnitude and/or acceptability of environmental or social impacts (eg. on the basis of land take or visual impact).

The “No Plan” option would have a number of negative outcomes. These include a disrupted, unreliable and poor quality of electricity supply that would continue to impact on Addis Ababa’s and the surrounding regions industries, services, schools and residential settlements; missed opportunities to maximize both internal and external investment in industry and commerce; unrealised generation of employment that would otherwise result from improved power security and the subsequent positive impact on the economy; missed opportunity to improve levels of connectivity and the delivery of education and healthcare services through greater reliability and use of IT and medical equipment, access to the internet as well as basic lighting; continued reliance on thermal generation, including from expensive and polluting small scale diesel generators; and further inhibition of sustainable development via the continued reliance on biomass (charcoal) for cooking from unsustainable forestry.

6. Potential Impacts

Positive Impacts

The Project will generate a number beneficial impacts. These are:

Energy Supply, Cost Reduction and Reliability: The Project will refurbish and upgrade the distribution “backbone”, largely removing supply constraints and allow connection and expansion of the wider distribution network without having additional impact on surrounding land use. The overall impact is anticipated to be beneficial due to a more reliable, re-enforced and expanded energy supply to residents and businesses and will help service the rapid rate of new development within Addis Ababa city and its surrounds. The Project will help address the connection backlog experienced by some customers due to lack of capacity. Improved coverage and reliability will also help improve mobile phone and internet services, which are currently impacted during interrupted supply. The costs and inconvenience associated with using substitute forms of energy supply will also be reduced, as frequent power outage forces both households and businesses to switch to diesel generators, These substitutes
incure additional expenses and inconvenience to the users and businesses, and in particular Small and Medium Size Enterprises (SMEs) which cannot afford substitutes, as they are forced to close during power disruptions resulting in lost production while still incurring costs of labour and overheads. The Project will also stabilize voltage fluctuations and power surges thus reducing the potential for damage of domestic appliances and industrial equipment.

**Stimulation of Regional Economic Growth:** Increased power supply and improved reliability will stimulate economic growth by improving the efficiency of production in areas with existing grid access and increasing the attractiveness of areas that are currently off-grid or served by poor or intermittent power supply. Improved access to electricity will provide opportunities for increased mechanisation and intensification of farming which will be required to feed the expanding population. The quality of education provided in schools, universities and other capacity building institutions could also improve. The Project will help the development of the light industry, tourism, retail and agricultural sectors, thereby stimulating job creation and promoting economic growth.

**Stimulation of Local Economic Growth:** The Project will generate employment for both unskilled and semi-skilled labour which will be sourced within Addis Ababa, from within the local project area. The procurement of local goods for the Project will stimulate the local economy through the placement of orders with domestic manufacturers. Temporary, secondary beneficial impacts on local businesses will result from the need to provide for food and lodgings and retail opportunities in the local project areas.

**Impact on Women:** The temporary, secondary beneficial impacts on local businesses mentioned above are also likely to benefit local women working at local markets / within hotels providing lodgings and retail opportunities to construction site workers.

**Community Health and Safety:** The refurbishment and replacement of old and contaminated equipment as well as the vegetation clearance works will improve the safety of the system not only to those operating and maintaining the infrastructure but also the general public living in the vicinity of the equipment.

**Landscape and Visual Impacts:** The replacement of damaged poles, correction of sagging lines, removal of aging transformer equipment and use of underground cables in urban areas and replacement of some above ground lines will help to reduce the visual impact of some sites.

**Deforestation and Climate Change:** Through improvements to the power transmission and distribution network the reliance on more carbon intensive localised energy sources such as diesel generators and biomass fuelled stoves will be reduced. A reduction in the use of biomass will also help reduce the rate of deforestation, which is a significant issue in Addis Ababa and the wider study area.

**Negative Impacts**

The main adverse environmental and social impacts are likely to be:

**Land Take, Physical and Economic Displacement:** New feeders, cables and overhead lines will be located within existing road reserves wherever possible, while the routing of overhead line distribution feeders and underground cables is sufficiently flexible such that direct impacts on structures can almost always be avoided. The presence of the feeder will limit the use of the land in that structures should not be constructed within the RoW and that the height of the vegetation that can be grown beneath the lines will need to be limited. Only very limited physical displacement of people or their property is currently anticipated. At this stage it is expected that only the Mekanisa-Gofa subproject (in Component III) will precipitate physical and economic displacement along the 1.9 km long 132kV transmission line from Gofa Substation to Mekanisa Substation. According to the ESIA and RAP prepared for the Mekanisa-Gofa subproject, one (1) household comprising 5 people located within the ROW will be affected, while another 52 households will lose temporary access to their agricultural land for a period of time during construction of the T-line (at present they cultivate under the existing T-line in the ROW). This land is
government land along a floodplain which is cultivated seasonally. In addition, the subproject will cause the partial demolition of a hay/fodder storage shed belonging to a group of seven dairy cooperatives which have a total membership of 73 (52 women) affecting an estimated number of 365 people, and two fences. In total 630 people may be affected and, except 5, for all the impact is temporary livelihood displacement. The main concerns raised during consultations in this respect are fairness of compensation amount, the need for special attention for vulnerable households (female headed and labour poor HHs), clarity on whether displacement of the vegetable growers is regarded as temporary or permanent, and clarity on project construction time line and the need for adequate advance notice.

**Waste Management and Disposal:** The most significant environmental impact will be the generation of a substantial amount of solid and liquid waste in the form of replaced metals structures, cables, packaging, as well as hazardous wastes such as polychlorinated biphenyls (PCBs), transformer oils, fluorescent bulbs and a certain amount of heavy metals (chromium, copper and arsenic). Some wastes (eg. non-hazardous metals and cables) are sold to recyclers. However, at present in Ethiopia there are no facilities to dispose of hazardous waste. Waste generators (such as EEP and EEU) are therefore asked to store waste until such time as waste disposal facilities are in place to accommodate specific waste types.

**Hazardous Materials:** These are likely to include creosote for treatment of wooden poles, paints and rust removers, oils for top up of transformer fluids, fuel and oils for site vehicles etc. Poor storage and handling of hazardous materials can result in the contamination of the ground, groundwater and surface water sources as well as cause injury to workers who accidentally come into contact with them.

**Contaminated Land:** Existing contaminated soil from past site activities which could excavated during construction could result in potential health and safety implications for ground works staff, and could also result in contamination of groundwater and surface water. There is also a risk of soil contamination from spillages of fuel from plant and from poor handling of materials used on site such as paint, fuels or oils.

**Occupational Health and Safety:** Electrocution is the main risk in this context due to high voltages and working at height, particularly during installation and maintenance works. Freak accidents may occur which can result in injury and fatalities. Use of PPE is reportedly generally poor, and will need to be addressed.

**Community Health and Safety:** The dense and unplanned settlement pattern in Addis Ababa, lack of observance of the ROW reserve of the power line coupled with low level of awareness makes community safety issue particularly challenging. This has been known to result in accidents (sometimes fatal) particularly in stormy weather conditions and with old lines. Risks include those associated with the operation of vehicles, plant and equipment in close proximity to settlement areas and schools.

**Archaeological and Cultural Heritage Sites:** There is potential for impacts on culturally sensitive sites such as churches, graveyards and community meeting sites from routing distribution lines within or close to such sites. Along the Mekanisa-Gofa transmission line, the setting and tranquillity of the graveyard will also be temporarily impacted during the construction phase, but it is not anticipated that any graves will require removal since the line will be routed around the graveyard. Chance finds could be found in more rural, less disturbed areas.

**Other Negative Impacts:** Environmental and social impacts during construction will relate dust and noise emissions, traffic and movement disruptions, soil erosion due to excavation activities, and power outages, all of which will be temporary. Some trees along the sidewalks will have to be removed, particularly where the underground cables are to be laid.

**Climate Change:** The Project consists of rehabilitation and upgrading of existing transmission and distribution network in a predominantly urban area. Minimal clearing of vegetation will be necessary. An underground cable of 16km is to be placed within the road reserve in areas where there is no history
of flooding and/or where drainage facilities have been provided by the new road infrastructure. The 1.9 km long overhead 132kV transmission line will replace an existing 132kV line and will remain within the existing ROW. The low and medium voltage distribution lines will replace existing ones. Thus the Project’s vulnerability to climate risk, as well as its contribution to climate change, is considered minimal.

**Cumulative Impacts:** These are generally considered to be minor in magnitude, and consist of: competition for development land between the Project and other infrastructure; construction impacts on local communities arising from road traffic and noise and air quality impacts; a cumulative demand for construction plant materials as well as electrical equipment; and the additional generation of waste electrical materials and equipment for disposal during construction and refurbishment as well as during maintenance.

7. Mitigation and Enhancement Measures, and Complementary Initiatives

**Physical and Economic Displacement:** For the Mekanisa-Gofa subproject, the number of PAPs will be verified prior to commencement of construction to determine the exact number and breakdown of PAPs. At this stage it has been proposed that, in accordance with the existing national processes, the single household that will be physically displaced will receive compensation and will be relocated, while the dairy cooperative will receive compensation for the demolition of the hay shed. The 52 households belonging to the vegetable producers’ cooperative will receive compensation for losing temporary access to their agricultural land for a period of time during construction of the T-line. The households will be able to resume their cultivation after the new T-line is in place.

**Waste Management and Disposal:** During project start up, various options for disposal of waste will be explored. The Ministry of Environment, Forests and Climate Change (MOEFCC) is developing an inventory for all Persistent Organic Pollutants (POPs) including PCBs, as required by the Stockholm Convention which Ethiopia has ratified. After that a national implementation plan will be prepared and submitted to the Stockholm Convention Secretariat for funding the action plan. The MOEFCC currently has different groups working on specific POPs, while the University of Addis Ababa is conducting a study to assess the situation in terms of used oils and their use and disposal and the legality of the current disposal/reuse practices, with a view to recommend disposal and recycling options. At present, EEU and EEP store PCBs at their warehouses, while oil waste is sold to private recyclers. Metal wastes, cables, transformers and capacitors will be sold to recycling outfits, as is the current practice. There are plans to establish municipal facilities for the re-use, recycling and disposal of hazardous waste. The facilities are not as yet available and, in the interim, EEP and EEU will seek to reduce the quantity of waste generated by the Project and its construction and operational activities, and provide a secure, central holding facility for redundant plant and materials generated during Project implementation.

**Hazardous Materials:** Procedures for safe storage and handling of hazardous materials will be defined and personnel handling these materials will be provided with appropriate training (see Section 7 below).

**Contaminated Land:** Any contamination caused by historic site activities will first be cleaned up in the immediate work area prior to commencing construction and installation activities.

**Occupational Health and Safety:** The high voltage underground cables will be properly insulated and placed in a pipe 1m to 2 m below the ground. Electrocuton risks during installation and maintenance works will be mitigated through following proper OHS procedures and rigorous and persistent awareness training will be undertaken to ensure OHS procedures and use of PPE are applied.

**Community Health and Safety:** Health and safety risks, including the risks of Sexually Transmitted Infections (STI) and HIV/AIDS propagation, will be mitigated through implementation of a community safety management system and procedures by the EEP and EEU which will include training and awareness and sensitisation programs for the workforce and also for the local community. Regular inspections will be carried out regularly to prevent encroachment of houses onto the reserve, and attention be paid to appropriate site signage, while other deterrents (such as razor wire) will be placed...
on the poles to prevent the use of the ladders on the side of the poles by children. The laying of underground cables provides opportunities to improve the sidewalks after works are completed thereby enhancing the safety and comfort of pedestrians.

**Archaeological and Cultural Heritage Sites:** Any potential impacts on such sites should be discussed during community consultation activities and measures to avoid any impacts agreed with the local community during the detailed design and pre-construction stages. Every effort will be made to avoid graves and graveyards, by re-routing lines or finding alternative locations for permanent infrastructure. Where any cultural sites or archaeological chance finds are identified during construction, works will cease immediately, the area will be cordoned off and the contractor will contact the Project Implementation Team (PIT) who will alert the EEP EHSQ. No site workers will be allowed back into the area has been surveyed and assessed by the EEP EHSQ and if necessary, the district archaeological authorities and a management approach has been agree with the relevant authorities.

**Other Negative Impacts:** Dust will be suppressed by watering sections to be worked on, while sensitization of the public will appease impacts due to noise emissions, traffic and movement disruptions. Where vegetation and trees have been removed along the new trees, plants and shrubs will replanted, presenting an opportunity for beautifying the city.

**Complementary Initiatives:** As indicated above, the displacement impact of the Project is limited as it necessitates the relocation of only one household. The livelihood displacement impact on the 53 land plots which will be traversed during construction is expected to be temporary. Therefore, an extensive resettlement and re-insertion plan is not required. Among the complementary initiatives planned are the organization of ESHS training for all contractors and staff including on gender based issues, non-use of child labour and prevention of spread of infectious diseases including HIV/AIDS.

7. Environmental Hazard Management

To address both occupational and community health and safety as well as environmental risks and hazards, an Health, Safety and Environment (HSE) Plan will be prepared for both the construction and operational phases of the Project. This will include a company HSE policy and measures to comply with national laws and international guidelines. Aspects to be covered in this Plan include:

- Basic HSE training for all employees including the local workforce;
- Training in the use of all equipment;
- Advanced HSE training for those carrying out certain activities (waste management, dispensing hazardous materials, refuelling etc.);
- Provision and use of Personal Protective Equipment (PPE);
- Traffic management plan and driver training;
- Accident prevention and monitoring;
- Safeguards to environmental pollution of air, land and water resources;
- First aid; and
- Emergency Response Procedures including spillages.

Health education on communicable diseases including Sexually Transmitted Infections (STIs) will be undertaken as part of the induction training for workforce members. Provision will be made for education awareness of communicable diseases within the wider community, if deemed relevant, and undertaken in collaboration with NGOs relevant to health and care and the local authorities (woredas).
8. Environmental and Social Management and Monitoring

A Joint Project Coordination (JPC) Team will be set up by EEP and EEU. The EEP and EEU will each have a Project Management Unit (PMU) under the JPC. The JPC will hire a Consultant (CJPC) who will be responsible coordinating, managing and monitoring the implementation of the Project through the two PMUs. Each PMU will be staffed with a Project Manager, a transmission engineer, a substation engineer, distribution system engineer civil engineer, a project accountant, an environmentalist/health and safety specialist, a social expert, a wayleaves officer and a procurement officer. As part of his assigned duties, the CJPC will be responsible for ensuring that environmental and social mitigation measures are implemented by the Contractor(s) in line with the ESMPs prepared for the individual projects. The respective EEP and EEU PMU’s environmentalists/health and safety specialists will be in charge of monitoring environmental and social as well as occupational and community health and safety issues, and ensuring compliance with both the ESMP and national and AfDB and JICA safeguards requirements. The CJPC will submit environmental and social monitoring reports to MOWIE, AfDB and JICA on a quarterly basis using an agreed format.

A Construction Environmental and Social Management Plan (CESMP) will be developed by the contractor(s) to implement the ESMP requirements associated with the construction and commissioning phases of the AADMP project(s). This requirement will be passed onto the Contractors (and their subcontractors) via main and subcontract clauses in the bid documents developed by EEP. The CESMP will identify methods for addressing impacts identified in the Project ESMP and any additional impacts that the contractor(s) may identify during the construction phase. The CESMP will be agreed by PIT/EEP and the relevant authorities, and will be enforced by the contractor’s site manager and its implementation periodically audited by EEP E&S Office. All workers taking part in the construction works will be informed of their responsibilities in regards to the CESMP and be trained to comply with its requirements.

Similarly, an Operational Health Safety and Environment Plan (OHSEMP) will be prepared by EEU for the packages in order to ensure that the operation and maintenance is carried out so as to avoid harm to environmental and host communities. This will be incorporated into the overall EEU Operations and Maintenance Manuals (OMM). The OHSEMP requirements will be enforced by the EEU operations site manager and implementation periodically audited by the EEU Environmental, Health, Safety, Quality and Performance Excellence Unit (EHSQ & PE). All workers taking part in operation and maintenance works shall be informed of their responsibilities in regards to the OHSEMP and be trained to comply with its requirements.

In addition, the CESMP and OHSEMP will include the following individual plan elements: A Local Recruitment Plan; Health, Safety and Environmental Management Plan; Waste Management Plan (to include a waste inventory, disposal options and preferred disposal methods, as well as costs), Stakeholder Engagement Plan (SEP); Training and Capacity Building; Project Commitment to Worker’s Rights; and Project Code of Conduct.

Summaries of the ESMPs for the refurbishment and upgrading of existing overhead distribution lines including feeders, refurbishment and upgrading of existing substations, installation of new feeders and installation of new substations are presented below in Tables 2a, 2b, 2c and 2d respectively.
## Table 2a: Summary ESMP – Refurbishment and Upgrading of Existing Overhead Distribution Lines Including Feeders

<table>
<thead>
<tr>
<th>Project Activities</th>
<th>Potential impacts of proposed projects</th>
<th>Mitigation / Enhancement Measures</th>
<th>Responsibility</th>
<th>Timing/ Frequency</th>
<th>Monitoring Indicators</th>
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</thead>
<tbody>
<tr>
<td>Preconstruction Stage – no impacts envisaged</td>
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<tr>
<td><strong>Construction (Refurbishment) Stage</strong></td>
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<tr>
<td>Employment of Local Labour</td>
<td>- Economic development - Capacity building</td>
<td>- Maximise local employment - Provide training to local labour</td>
<td>EEP / Contractor</td>
<td>Throughout works</td>
<td>% local workers employed as a % of total workforce</td>
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<tr>
<td>Refurbishment and upgrading works</td>
<td>- Electrocution of workers</td>
<td>- All staff involved in live-wire works to have protective clothing and have adequate training</td>
<td>Contractor</td>
<td>Throughout works</td>
<td>Accident statistics</td>
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<tr>
<td></td>
<td>- Disruption to power supply and local residents / businesses</td>
<td>- Inform power users of outages in advance of works and provide back-up power supply for extended outages</td>
<td>Contractor / EEP</td>
<td>In advance of works</td>
<td>No of complaints</td>
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<tr>
<td>Selection and use of Plant and Equipment</td>
<td>- Air pollution and noise nuisance to local community - Accidents and incidents including with local community</td>
<td>- Liaise with local community ahead of works - Control speed of construction vehicles - Prohibit idling and over revving of vehicles - Regular maintenance of plant and equipment</td>
<td>Contractor</td>
<td>Daily inspection</td>
<td>No. of pollution incidents - No. of complaints</td>
</tr>
<tr>
<td>Disposal of Refurbishment Wastes</td>
<td>- Solid waste generation (damaged and degraded parts and materials) resulting in fly-tipping / contamination</td>
<td>- Solid wastes to be collected centrally, removed regularly from site and disposed of at designated waste recycling / disposal sites</td>
<td>Contractor</td>
<td>Daily inspection</td>
<td>No. of fly tipping incidents - No. of waste related prosecutions</td>
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<tr>
<td>Operation Stage</td>
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<tr>
<td>Employment of Local Labour</td>
<td>- Economic development - Capacity building</td>
<td>- Maximise local employment on maintenance - Provide training to employees</td>
<td>EEU</td>
<td>Throughout operation</td>
<td>% local workers employed as a % of total workforce</td>
</tr>
</tbody>
</table>

13
| Maintenance of Distribution Lines | - Electrical injury of workers  
- All staff involved in live-wire works to have PPE and adequate training | FFU | Throughout operation | - Accident statistics |
|-----------------------------------|-----------------------------------------------------------|------|---------------------|----------------------|
| RoW Maintenance                   | - Removal of vegetation and trees causing environmental degradation  
- Mark out areas for clearance and use manual methods / prohibit use of fire | EEU | As per maintenance regime | - N/A |
| Disposal of Maintenance Wastes    | - Solid waste generation (damaged and degraded parts and materials) resulting in fly-tipping/contamination.  
- Solid wastes to be collected centrally, removed regularly from site and disposed of at designated waste recycling / disposal sites | EEU | Daily inspection | - No. of fly tipping incidents  
- No. of waste related prosecutions |
| Decommissioning Stage             | - Waste management and recycling  
- Re-vegetation and reinstatement  
- Infilling, site levelling and re-vegetation with native species  
- Solid wastes collected centrally and disposed of at designated waste recycling / disposal sites or reused in other projects | Contractor / EEP | Decommissioning | - Return of land to its quasi original state |
<table>
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<tr>
<th>Project Activities</th>
<th>Potential Impacts of proposed projects</th>
<th>Mitigation / Enhancement Measures</th>
<th>Responsibility</th>
<th>Timing/Frequency</th>
<th>Monitoring Indicators</th>
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<tr>
<td><strong>Construction Stage</strong></td>
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<tr>
<td>Employment of Local Labour</td>
<td>- Economic development</td>
<td>- Maximise local employment</td>
<td>Contractor</td>
<td>Throughout works</td>
<td>- % local workers employed as a % of total workforce</td>
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<td>- Capacity building</td>
<td>- Provide training to local labour</td>
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<td>Refurbishment and upgrading works</td>
<td>- Electrocution of workers</td>
<td>- All staff involved in live-equipment works to have protective clothing and have adequate training</td>
<td>Contractor</td>
<td>Throughout works</td>
<td>- Accident statistics</td>
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<td>- Disruption to power supply and local residents / businesses</td>
<td>- Inform power users of outages in advance of works and provide back-up power supply for extended outages</td>
<td>Contractor / EEP</td>
<td>In advance of works</td>
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<td>Daily inspection</td>
<td>- No. of pollution incidents</td>
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<td>- Accidents and incidents including with local community</td>
<td>- Control speed of construction vehicles</td>
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<td>- Prohibit idling and over revving of vehicles</td>
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<td>- Regular maintenance of plant and equipment</td>
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<tr>
<td>Storage and of Transformer Upgrade and Refurbishment Materials</td>
<td>- Spillage and leakage impacts on land and ground/surface water quality</td>
<td>- Provision of bunded, lockable storage areas</td>
<td>Contractor</td>
<td>Daily inspection</td>
<td>- No. of pollution incidents</td>
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<td>- Suitably trained personnel only to dispense and work with hazardous material</td>
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<td>- Provision of suitable PPE</td>
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<td>- Immediately clean up spillages</td>
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<tr>
<td>Disposal of Refurbishment Wastes</td>
<td>- Solid waste generation (damaged parts and materials), flytipping and contamination</td>
<td>- All solid wastes should be collected centrally, removed regularly and disposed of to designated waste disposal sites</td>
<td>Contractor</td>
<td>Daily inspection</td>
<td>- Presence of solid wastes left on site, fly tipping and littering</td>
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<td>- Liquid waste generation and pollution to ground, groundwater and</td>
<td>- All PCB contaminated and other oils to be</td>
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<td>- No. of waste</td>
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<tr>
<td>Operation Stage</td>
<td>Surface Water</td>
<td>Disposed of as Hazardous Waste</td>
<td>Related Prosecutions</td>
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</table>
| **Employment of Local Labour** | - Economic development  
- Capacity building | - Maximise local employment on maintenance  
- Provide training to employees | EEU  
Throughout operation  
- Local workers employed as a % of total workforce |
| **Maintenance of Substation sites** | - Electrocution of workers | - All staff involved in live-equipment works to have PPE and adequate training | EEU  
Throughout operation  
- Accident statistics |
| **Disposal of Maintenance Wastes** | - Solid waste generation (damaged parts and materials), flytipping  
- Liquid waste generation and pollution to ground, groundwater and surface water | - All solid wastes should be collected centrally, removed regularly and disposed of to a designated waste disposal sites  
- All PCB contaminated and other oils to be disposed of as hazardous waste | Contractor  
Daily inspection  
- Presence of solid wastes left on site, fly tipping and littering  
- No. of waste related prosecutions |
| **Decommissioning Stage** | - Waste management and recycling  
- Re-vegetation and reinstatement | - Demolition of buildings, site decontamination and infilling / levelling and landscaping, re-vegetation with native species  
- Solid wastes to be collected centrally and disposed of at designated waste recycling / disposal sites or reused in other projects | Contractor / EEP  
Decommissioning  
- Return of land to its quasi original state |
<table>
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<tr>
<th>Project Activities</th>
<th>Potential impacts of proposed projects</th>
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<th>Responsibility</th>
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<tr>
<td><strong>Preconstruction Stage</strong></td>
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</table>
| Route Selection and RoW Acquisition | - Displacement of people and their property  
- Reduction in size/viability of land parcels for crop production/ grazing  
- Change in land use rights and access to land for farming as a result of wayleave agreements | - Consult local community and identify PAFS  
- Undertake environmental assessment (inc. ESIA) and produce ESMP and RAP as applicable  
- Develop (fair and equitable) compensation framework and agree entitlement with entitlement and /or agree with local community other form of compensation  
- Educate community as to use of RoW post construction (for grazing/crop production) | EEP            | Design Stage     | - No. of consultation meetings held  
- Compensation paid  
- No. of complaints  
- Livelihood status before and after works                                                                                                           |                |                  | |
| **Construction Stage**     |                                                                                                        |                                                                                                                                                                                                                                                                                        |                |                  |                                                                                       |
| Employment of Local Labour | - Economic development  
- Capacity building  
- Employment of women as part of workforce | - Maximise local employment including women  
- Provide training to local labour | EEP / Contractor | Throughout construction | - local workers employed as a % of total workforce  
- women employed as % of total workforce                                                                                                               |                |                  | |
| Site access roads          | - Soil erosion  
- Air pollution (dust)  
- Water pollution (sedimentation)  
- Habitat loss  
- Accidents and incidents involving local community | - Avoid use of heavy plant on steep terrain  
- Pave permanent access roads to prevent erosion and dust  
- Avoid important habitats  
- Erect traffic warning signs in the local language in public areas  
- Set and enforce speed limits for construction traffic using access roads | Contractor      | Daily inspection | - No. of pollution incidents  
- Accident statistics  
- No. of complaints                                                                                                                                       |                |                  | |
| RoW clearance              | - Destruction of vegetation, including | - Mark out areas for clearance and use manual | Contractor      | Daily inspection | - Area of land (acres)                                                                                                                                      |                |                  |
| Excavation and foundation works | Contractor | Daily inspection | - No. of pollution incidents  
- No. of complaints | - Air pollution (dust and nuisance)  
- Water pollution (sedimentation of watercourses) |
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<td></td>
<td>Contractor / EEP</td>
<td>Prior to and during construction.</td>
<td>- Items of archaeological or cultural significance disturbed or destroyed</td>
<td>- Destruction of Archaeology and Cultural Heritage</td>
</tr>
</tbody>
</table>
|                                 | Contractor | Daily inspection | - No. of pollution incidents  
- No. of complaints | - Air pollution and noise nuisance to local community  
- Accidents and incidents including with local community |
|                                 | Contractor | Daily inspection | - Type and number of storage receptacles / areas provided | - Incidents and accidents to workforce  
- Spills and leaks (causing |
|                                 | Contractor | Daily inspection | - Type and number of storage receptacles / areas provided | - Provision of bunded, lockable storage areas  
- Suitably trained personnel only to dispense and work with hazardous materials |
<table>
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<tr>
<th><strong>Materials</strong></th>
<th><strong>Establishment of worker camps and depots</strong></th>
<th><strong>Commissioning</strong></th>
<th><strong>Closure of Worker Camps and Depots</strong></th>
</tr>
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<tbody>
<tr>
<td>ground/groundwater and / or water pollution</td>
<td>- Disruption to local residents (antisocial behaviour) - Spread of disease - Conflicts over natural resources - Solid and liquid waste generation and associated pollution</td>
<td>- Avoid use of worker camps or site away from settlements - Provide adequate drinking water and sanitation located away from water bodies and groundwater supplies (wells) - Do not allow collection of natural resources (wood) by workers - Provide cultural awareness briefings - All solid wastes from work sites and camps to be collected centrally, removed regularly and disposed of to designated waste disposal sites</td>
<td>Contractor</td>
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<td>- Provision of suitable PPE - Training in spillage response - Use of drip trays and spillage kits</td>
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<td>Operation Stage</td>
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</tbody>
</table>
| Employment of Local Labour           | - Economic development  
- Capacity building  
- Employment of women as part of workforce | EEU                  | Throughout construction  
- local workers employed as a % of total workforce  
- women employed as % of total workforce |
| Health and Safety Awareness           | - Accidents and incidents as a result of electrocution during accidental contact or vandalism  
- Raise awareness of health and safety risks of tampering with live lines  
- RoW to be periodically cleared of tall trees | EEU                  | Throughout operation  
- No. of consultation meetings held  
- Accident statistics |
| Maintenance of Power line             | - Electrocution of workers  
- All staff involved in live-wire works to have protective clothing and have received adequate training  
- Risk of Fire  
- Prohibit use of fire for vegetation management  
- Wayleave to be periodically cleared of tall trees  
- Overhead lines to be regularly inspected and maintained | EEU                  | Throughout operation  
- Accident statistics |
| Storage and dispensing of Operational and Maintenance Materials | - Health and Safety (accidents),  
- Spillage and leaks causing ground, groundwater and surface water pollution  
- Provision of bunded, lockable storage areas  
- Suitably trained personnel only to dispense and work with hazardous material  
- Provision of suitable PPE and spillage kits  
- Training in spillage clean up procedures | EEP                  | Daily inspection  
- No. of pollution incidents  
- Accident statistics  
- No. of spillage kits |
<table>
<thead>
<tr>
<th><strong>Maintenance of RoW</strong></th>
<th><strong>Operational and Maintenance Wastes</strong></th>
<th><strong>Decommissioning Stage</strong></th>
</tr>
</thead>
</table>
| - Loss of crops and native flora  
- Colonization by invasive species | - Solid waste generation (damaged parts and materials) and associated pollution  
- Air pollution from burning waste | **Site restoration** |
| - Mark out areas for clearance and use manual method of clearance  
- Undertake selective clearance by removing tall woody species leaving samplings, for quick regeneration of vegetation along the way-leave  
- Prohibit use of fire for maintenance of RoW | - All solid wastes should be collected centrally, removed regularly and disposed of to designated waste disposal sites  
- Do not allow burning of waste near residential properties  
- Do not burn creosote treated poles. | **- Waste management and recycling  
- Re-vegetation and reinstatement** |
| EEU | EEP | **Contractor / EEP** |
| Throughout operation as per maintenance regime | Daily inspection | **- Return of land to its quasi original state** |
| - Land area cleared (acres)  
- No. of trees cleared  
- No. of instances of invasive species | - No. of incidences of fly tipping and littering  
- Waste related prosecutions  
- No. of complaints | **Decommissioning** |
### Table 2d: Summary ESMP – Installation of New Substations

<table>
<thead>
<tr>
<th>Project Activities</th>
<th>Potential Impacts of proposed projects</th>
<th>Mitigation / Enhancement Measures</th>
<th>Responsibility</th>
<th>Timing / Frequency</th>
<th>Monitoring Indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Preconstruction Stage</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| Site Selection and Acquisition | - Displacement of people and their property  
- Reduction in size/viability of land parcels for crop production/ grazing  
- Change in land use rights and access to land for farming and grazing | - Consult local community and identify PAPS  
- Undertake environmental assessment (inc. ESIA) and produce ESMP and RAP as applicable  
- Develop (fair and equitable) compensation framework and agree entitlement with entitlement and/or agree with local community other form of compensation | EEP | Design Stage | - No. of consultation meetings held  
- Compensation paid  
- No. of complaints  
- Livelihood status before and after works |
| **Construction Stage** | | | | | |
| Employment of Local Labour | - Economic development  
- Capacity building  
- Employment of women as part of workforce | - Maximise local employment  
- Provide training to local labour | EEP / Contractor | Throughout construction | - local workers employed as % of total workforce  
- women employed as % of total workforce |
| Site access roads | - Soil erosion  
- Air pollution (dust)  
- Water pollution (sedimentation)  
- Habitat loss  
- Accidents and incidents involving local community | - Avoid use of heavy plant on steep terrain  
- Pave permanent access roads to prevent erosion and dust  
- Avoid important habitats  
- Erect traffic warning signs in the local language in public areas  
- Set and enforce speed limits for construction traffic using access roads. | Contractor | Daily inspection | - No. of pollution incidents  
- Accident statistics  
- No. of complaints |
| Site Clearance | - Permanent loss of crops, grazing land and trees.  
- Loss of terrestrial flora (including habitats)  
- Impact on water bodies (e.g. sedimentation)  
- Undertake site clearance once crops / timber removed and compensate for losses.  
- Mark out areas for clearance and use manual method of clearance  
- Compensate for habitat loss elsewhere | Contractor | Daily inspection | - No. and type of trees cut down  
- Area of land (acres) cleared  
- Area of habitat (acres) cleared  
- No. of native tree/shrub species planted |
| --- | --- | --- | --- | --- |
| Excavation and foundation works | - Air pollution (dust)  
- Water pollution (sedimentation)  
- Destruction of Archaeology / Cultural Heritage  
- Cordon off areas for public access  
- Avoid surface water runoff entering watercourses by diverting flows  
- Cover spoil stockpiles to prevent materials becoming airborne during hot/dry conditions  
- Backfill excavated soils as soon as possible to prevent exposure to wind or water  
- Landscape/re-vegetate surplus excavation materials to prevent erosion  
- Consult with local community regarding cultural heritage sites  
- Implement chance finds procedure | Contractor  
EEP | Daily inspection  
Prior to and during construction. | - No. of pollution incidents  
- No. of complaints  
- Items of archaeological or cultural significance disturbed or destroyed |
| Selection and use of Plant and Equipment | - Air pollution and noise nuisance to local community  
- Accidents and incidents including with local community  
- Liaise with local community ahead of works  
- Control speed of construction vehicles  
- Prohibit idling and over revving of vehicles  
- Regular maintenance of plant and equipment | Contractor | Daily inspection | - No. of pollution incidents  
- No. of complaints |
| Storage and Dispensing of | - Incidents and accidents  
- Spills and leaks (causing  
- Provision of bunded, lockable storage areas  
- Suitably trained personnel only to dispense and | Contractor | Daily inspection | - Type and number of storage receptacles / |
| Construction Materials | groundwater and / or water pollution | work with hazardous materials  
- Provision of suitable PPE  
- Training in spillage response  
- Use of drip trays and spillage kits | areas provided  
- No. of pollution incidents  
- Accident statistics  
- Availability of spillage kits |
|-------------------------|--------------------------------------|------------------------------------------------------------------|
| Establishment of worker camps and depots | - Disruption to local residents (antisocial behaviour)  
- Spread of disease  
- Conflicts over natural resources  
- Solid and liquid waste generation and associated pollution | - Avoid use of worker camps or site away from settlements  
- Provide adequate drinking water and sanitation located away from water bodies and groundwater supplies (wells)  
- Do not allow collection of natural resources (wood) by workers  
- Provide cultural awareness briefings  
- All solid wastes from work sites and camps to be collected centrally, removed regularly and disposed to designated waste disposal sites | Contractor  
Daily inspection  
- No. of fly tipping and littering incidents  
- Waste related prosecutions  
- No. of complaints  
- No. of sanitary facilities available per head  
- No. of water supply pollution incidents  
- No. of instances of water borne disease |
| Closure of Worker Camps and Depots | - Solid and liquid waste generation  
- Landscape and visual impacts  
- Invasive species | - Remove all construction plant and equipment  
- Remove all solid and liquid wastes  
- Remove all temporary buildings  
- Remove all temporary access roads  
- Re-plant with local species | Contractor  
On completion of Construction Works  
-Site returned to its quasi original state |
| Operation Stage | | |
| Employment of Local Labour | - Economic development  
- Capacity building | - Maximise local employment  
- Provide training to local labour | EEU  
Throughout construction  
-local workers employed as a % of total workforce |
| **Storage and dispensing of Operational and Maintenance Materials** | - Health and Safety (accidents)  
- Spillage and leaks causing ground, groundwater and surface water pollution  
- Suitably trained personnel only to dispense and work with hazardous material  
- Provision of suitable PPE and spillage kits  
- Training in spillage clean up procedures | - Provision of bunded, lockable storage areas  
- Suitable and trained personnel only to dispense and work with hazardous material  
- Provision of suitable PPE and spillage kits  
- Training in spillage clean up procedures | EEP  
**Daily inspection** | - No. of pollution incidents  
- Accident statistics  
- No. of spillage kits |
| **Operational and Maintenance Wastes** | - Solid waste generation (damaged parts and materials) and associated pollution  
- Air pollution from burning waste | - All solid wastes should be collected centrally, removed regularly and disposed to designated waste disposal sites  
- Do not allow burning of waste near residential properties- | EEP  
**Daily inspection** | - No. of incidences of fly tipping and littering  
- Waste related prosecutions  
- No. of complaints |
| **Vandalism / Theft** | - Pollution by transformer oil and accidents (including electrocution) | - Secure substation and provide guarding  
- Install tamper proof equipment  
- Community education | EEU  
**Throughout operation** | - No of thefts  
- Disruption in service |

**Decommissioning Stage**

| **Site demolition and restoration** | - Waste generation  
- Re-vegetation and reinstatement | - Demolition of buildings, site decontamination and infilling / levelling and landscaping, re-vegetation with native species  
- Solid wastes to be collected centrally and disposed of at designated waste recycling / disposal sites or reused in other projects | Contractor / EEP  
Decommissioning | - Return of land to its quasi original state |
The total estimated cost of implementation of the ESMP is USD 80,000 over 4 years of project implementation, as shown in Table 3 below.

### Table 3: Estimated Annual Cost of ESMP Implementation

<table>
<thead>
<tr>
<th>Description of Activity</th>
<th>Estimated Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ETB</td>
</tr>
<tr>
<td>Compensation Cost (TBC)</td>
<td>0</td>
</tr>
<tr>
<td>Replanting/restoration costs (TBC)</td>
<td>0</td>
</tr>
<tr>
<td>PIT periodic auditing of contractor</td>
<td>220,000</td>
</tr>
<tr>
<td>Institutional Capacity Building Program (for local institutions including the local Woreda / national agencies responsible for advising on and inspecting aspects of implementation)</td>
<td>145,000</td>
</tr>
<tr>
<td>Post Construction Stage Environmental Audits</td>
<td>95,000</td>
</tr>
<tr>
<td>Estimated Annual Cost (rounded off)</td>
<td>460,000</td>
</tr>
<tr>
<td>Estimated cost over 4 year Project implementation period</td>
<td>1,840,000</td>
</tr>
<tr>
<td>Estimated total cost for Capacity Building within EEP and EEU*</td>
<td>1,013,725</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>3,773,725</strong></td>
</tr>
</tbody>
</table>

*Does not include purchase of vehicles

Exchange rate 1USD=23 ETB


**Consultations:** During the SESA consultations were held with potentially affected populations. The consultations and disclosure is fully documented in the final SESA and associated reports. Stakeholders consulted included local government administrations and community (project affected PAPs). For the more environmentally and socially sensitive Mekanisa-Gofa Transmission subproject, the anticipated environmental and social impacts of the Project and proposed mitigation measures were raised for discussion during the combined ESIA / RAP consultations at the conceptual stage of the subproject.

Key issues of concern identified by the stakeholders include:

- All of the organisations consulted are encouraging of many aspects of the Project, recognising its benefits and supporting its development.
- MOWIE requested that climate change and resilience should be considered as part of the Project.
- The city and regional administrations have each developed compensation frameworks with respect to the implementation of development AIDP projects and other development within the Oromia region. Both agreed that these should be consulted during the development of subproject specific RAPs.
- Several consultees, including the city administration, highlighted the lack of suitable waste disposal sites in Addis Ababa; in particular electrical waste and oils.
- Several consultees, including EEP environmental and social specialists, advised that international funding agency guidelines should be implemented, in particular those relating to compensation of PAPs.
- The woreda administrations all requested just and timely compensation must be achieved and PAP’s should not be displaced where possible.
- The local communities confirmed their support of the Project and the officials and the local authorities agreed to ensure that no persons would be allowed to encroach within project areas to avoid any unnecessary issues with respect to compensation.
- The PAPs emphasized the need of proper property measurement, valuation and record keeping of different properties such as size of farm land. These must be done in proper and professional manners to avoid complication during the execution of the compensation payment.
• PAPs are willing to cooperate with the Property Valuation Committee and the Resettlement Implementation Committee,
• Compensation cost / estimates to be provided prior to the commencement of construction works by the contractor,
• The public have also agreed not to make any new constructions inside the right of way after the inventory has been taken; and,
• PAPs requested to be given priority for employment opportunity during the construction works of the transmission line.

Disclosure: The Mekanisa-Gofa ESIA and RAP were approved by MOWIE on 22nd November 2016 (vide letter ref. no. MWIE/126/26/342). [The SESA, ESMF, ESMP and RAF documents were submitted to MOWIE for information purposes as national procedures are currently not in place for the conduct and review of strategic environmental and social assessments and associated documentation]. All the documents were publically disclosed by EEP and EEU in February 2017 on their websites. The documents have been disseminated to AA City Administration, the AA Environmental Protection Agency and woreda offices. Once the final design for the Mekanisa-Gofa Subproject design has been confirmed, the RAP will be updated accordingly, appropriately disclosed and submitted to AfDB and JICA for information purposes.

10. Institutional Capacities and Strengthening

EEP’s E&S Office and EEU’s ESHQ P&E team have identified a series of capacity building measures to enable them to conduct their roles and responsibilities in relation to implementation of the Project. The EEP’s E&S Office have identified the need for additional staff to support this project, as well as training for members of the E&S Office and for project coordinators and surveyors. Training is intended to help the environmental and social team members to: provide an update within respect to safeguard policies and procedures in order to improve the implementation of the environmental and social safeguards in power projects; prepare good quality environment and social monitoring reports; and update their knowledge with respect to new and emerging environmental issues and concepts. Training courses would cover topics such as: ESIA procedures, processes and reporting (including public consultation methods for PAPs and other stakeholders and resettlement planning and the implementation); checklist and format design; report writing; evaluation and reporting on community safety issues; national environmental and social impact assessment laws and standards, donor safeguard policies; environmental management system guidelines, principles and supporting system; and Geographic Positioning Systems (GPS).

In addition, in order to support monitoring activities, the EEP E&S Office have requested access to (or purchase as necessary) two double cabin pickup (4x4) vehicles; office equipment including desktop computers, laptops, printers, a photo copy machine and digital camera; and field equipment of a GPS and air sampler. The EEU EHSQ & PE Unit requires both short term and long term training as well as access to (or purchase of) office equipment and a 4x4 vehicle to access sites.

The total cost for capacity building over the implementation period is estimated to be USD 27,755 (without purchase of vehicles) for EEP E&S Office and USD 16,320 (without purchase of vehicles) for EEU ESHQ P&E.

11. Conclusion

The Project will be a major benefit to Addis Ababa city and the wider study area in respect of a more reliable, re-enforced and expanded energy supply to the developments underway and proposed including those associated with the Addis Ababa Integrated Development Plan (AAIDP). The proposed projects and programmes will help address the connection backlog experienced by some customers due to lack of capacity. Improved coverage and reliability will also help improve mobile phone and internet services, which are currently impacted during interrupted supply.

The majority of the predicted adverse impacts will manifest at the preconstruction and construction phases where the core effort in mitigation should be concentrated during construction. The main environmental
and social concerns are waste management (especially the disposal of hazardous waste given the lack of waste disposal capacity for electrical equipment); occupational health and safety and the minimal physical and temporary economic displacement. EEP and EEU will ensure that the construction contractors allocate sufficient financial resources to implement the recommended measures in the ESMP and is subject to clauses binding him to implementation of impact mitigation and monitoring as part of the construction works. EEP and EEU will also hire and fund competent supervisory staff to enforce compliance through surveillance and periodic monitoring throughout the construction and operation phases.

12. References and Contacts

Documents Consulted

EEP (July 2016); Addis Ababa Distribution Master Plan Study - Environmental and Social Management Plan (ESMP); Report (Final).
EEP (September 2015); Addis Ababa Distribution Master Plan Study, Final Report Volume 5 Part 1 – Strategic Environmental and Social Assessment.
EEP (September 2015); Addis Ababa Distribution Master Plan Study, Final Report Volume 5 Part 2 – Environmental and Social Management Framework.
EEP (August 2016); Mekanisa Gofa Transmission Line and Substations Upgrade Project Environmental and Social Impact Assessment (ESIA); Report (Final).
EEP (July 2016); Mekanisa Gofa Transmission Line and Substations Upgrade Project Resettlement Action Plan (RAP); Report (Final)

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