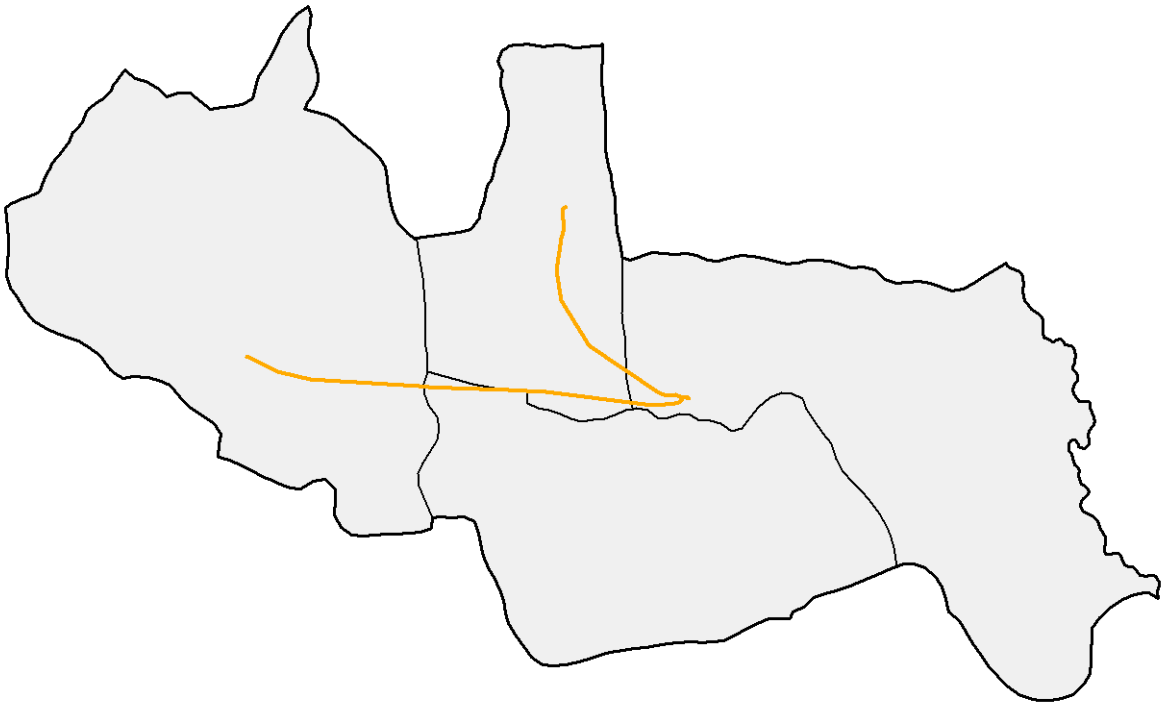

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA) FOR THE ELECTRIFICATION OF UIGE, ANGOLA – LOT 1, PHASE 2

Volume 3 – Non-Technical Summary

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ANGOLA

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ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA) FOR THE ELECTRIFICATION OF UÍGE, ANGOLA – LOT 1, PHASE 2

VOLUME 3 – NON-TECHNICAL SUMMARY

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1. Introduction

1.1. Scope of the report

This report is the Non-Technical Summary (NTS) of the Environmental and Social Impact Assessment (ESIA) of the Uíge Electrification Project – Lot 1, Phase 2 ("the Project"). The Environmental Impact Study has been developed to ensure that environmental and social issues are carefully considered and managed throughout the life cycle of the Project.

The Non-Technical Summary aims to summarise the most important aspects of the ESIA and constitutes an essential part of it. As it is developed and written clearly and succinctly in order to be understood by the general public, the NTS ensures that the information comprised in the ESIA is accessible to all.

1.2. Project Background

The government of Angola has defined the overarching objectives of the long-term strategy for 2025, aimed at increasing its population quality of life.

These objectives support themselves on the promotion of human development and the well-being of Angolans, the promotion of equitable and sustainable development, guaranteeing an economic rhythm and developing the national territory in a harmonious and sustainable manner.

In order to achieve these objectives, there is a need for adequate investment in the electricity sector.

The project is framed under the Presidential Decree 177/20 of April, 22nd, regarding transmission lines and distribution of energy from 66 kV and below 66 kV.

The main objective of this project is to supply electricity to the provincial capitals (Uíge) and the headquarters of municipalities and communes. The Project will achieve this through the construction of new substations (Buengas e Macocola) and the energy transmission and distribution lines.

1.3. Environmental and Social Impact Assessment

The Environmental and Social Impact Assessment (ESIA) is to **analyse the potential interference of the project** in the biophysical and socio-economic environment.

Subsequently, it proposes **measures to mitigate the negative effects and measures to enhance the positive impact**. Accordingly, it will enable its sustainable implementation in the construction, operation and deactivation phases.

The preparation of the ESIA included the following main activities:

- Description of the affected environment and development prospects;
- Preliminary identification of environmental aspects, i.e., elements of the project likely to result in environmental effects/impacts;
- Identification and analysis of the main potential effects/impacts of the project;
- Classification of the effects/impacts based on pre-established criteria;
- Formulation of measures to mitigate the negative effects/impacts and measures to promote the positive effects/impacts identified;
- Preparation of an Environmental Management Plan containing environmental management measures and monitoring/follow-up of impacts;
- Compilation of technical and/or knowledge gaps;
- Formulation of conclusions and recommendations based on the results of the Environmental Impact Study.

1.4. Environmental and Social Management Plan

The Environmental and Social Management Plan (ESMP) is a complement to the Environmental and Social Impact Assessment (ESIA), which presents a set of mitigation, compensation, monitoring and institutional measures to be adopted in the different phases of the project. The purpose of these measures is to minimise adverse environmental and social impacts and increase the benefits arising from the project

The Plan consists of a:

- **Occupational Health and Safety Plan:**
  - Drafting a list of potential hazards associated with the project and with mitigation measures for each hazard.
- **Preliminary Waste Management Plan:**
  - Presentation of the appropriate procedure for the different wastes generated in the different phases of the project.
- **Stakeholders Involvement Programme:**
  - Presentation of the activities to be carried out with the different project stakeholders in the three phases of the ESIA (work plan, initial and scoping and detailed assessment of environmental and social impacts and risks).
- **Air Quality and Noise Monitoring Programmes for the project:**
  - Planning for activities with the highest potential for dust, inhalable particles and noise emissions;
  - Presentation of mitigation measures to minimise the impacts of exhaust gas, dust and particle emissions and noise.
- **Environmental Education Plan:**
  - Raising awareness and training all stakeholders in this project on the relevant environmental and social aspects.

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2. Description of the project and the alternatives considered

2.1. Need and objective of the project

The energy sector is poorly developed in most provinces of Angola, particularly in rural and isolated urban areas. This project will contribute to increasing the population with access to the national electricity grid in the province of Uíge.

The main objectives of the project are to provide 2 000 households with electricity from the national grid and to provide street lighting to the headquarters of municipalities, communes and villages covered by the study area. In this way, the project will reduce the population's dependence on the use of generators and, consequently, minimise emissions from their use.

Another important contribution of the project for the province of Uíge is the potential development of the province's municipalities through the provision of infrastructure that will provide a favourable context for attracting investment and generating employment in sectors such as agriculture, commerce, hotels and industry.

The project will also play an important role in achieving the goals for the energy sector as well as the reduction of GHG emissions defined by the government in the Plan "Angola Energy 2025 – Long-term vision for the Energy Sector" and the "National Strategy for Climate Change Angola (2018-2030)", respectively.

2.2. Project location

The Project for the Electrification of Uíge is located in the Northern Region of Angola, in the Uíge Province. It extends for about 165 km, crossing several municipalities and communes of the Uíge Province (**Erro! A origem da referência não foi encontrada.**), these being:

- Damba Municipality, N'Soso Commune;
- Buengas Municipality, Quimbianda and Buengas Communes;
- Milunga Municipality, Macocola Commune;
- Sansa Pombo Municipality, Cuilo Pombo Communes.

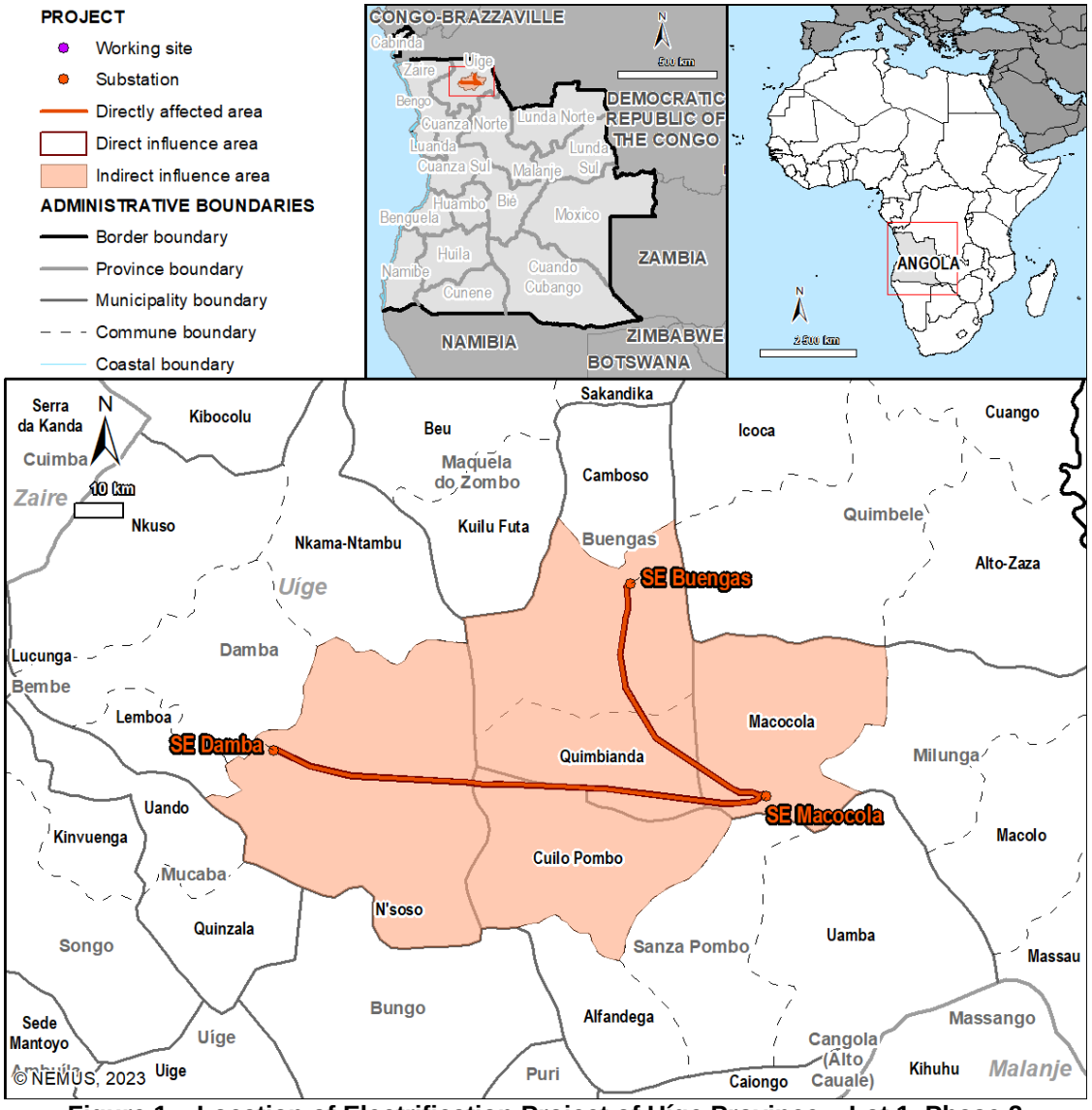

Figure 1 – Location of Electrification Project of Uíge Province – Lot 1, Phase 2

2.3. General characteristics

The Project for Electrification of Uíge – Lot 1, Phase 2 includes the construction of two new substations (Macocola e Buengas), the execution of 165 km of transmission lines (110 and 60 kV), 2 000 household connections and the supply of public lighting.

The project includes the studies, design, manufacture, transport, insurance, construction, assembly, reception and test works of the components listed in Table 1.

Table 1 – Project components

	Name	Specification
Substations (SS)		
New	Macocola SS	110/60/30 kV (1x40 MVA)
	Buengas SS	60/30 kV
Transmission Lines		
110 kV	Damba – Milunga (103,5 km)	Conductor type ACSR 326 mm^2 BEAR
60 kV	Macocola – Buengas (61,4km)	Conductor type ACSR 326 mm^2 BEAR
Household connections and public lighting		
-	Macocola and Milunga	1 000 household connections and public lighting
-	Village of Buengas	1 000 household connections and public lighting

Table 1 shows the specifications for the different components of the project. New substations such as Macocola e Buengas substations include the supply, installation, testing and commissioning of an air-insulated substation.

The substation of Macocola will have sections for the intersections with the 110; 60 and 30 kV transmission lines, while the substations of Buengas have intersections for 60 and 30 kV.

Figure 2 shows the route of the transmission lines between the project substations. The 100 and 60 kV transmission lines of the project have a single circuit with ACSR 326 mm^2 BEAR type conductor cable.

The 100 kV electric line between the existing substation of Damba and the new substation of Macocola has a total length of 103,5 km, while the 60 kV line connecting the new substations of Macocola and Buengas is 61,4 km long.

The implementation of the project's infrastructures will require various temporary infrastructures, namely access roads and temporary areas for the assembly of towers.

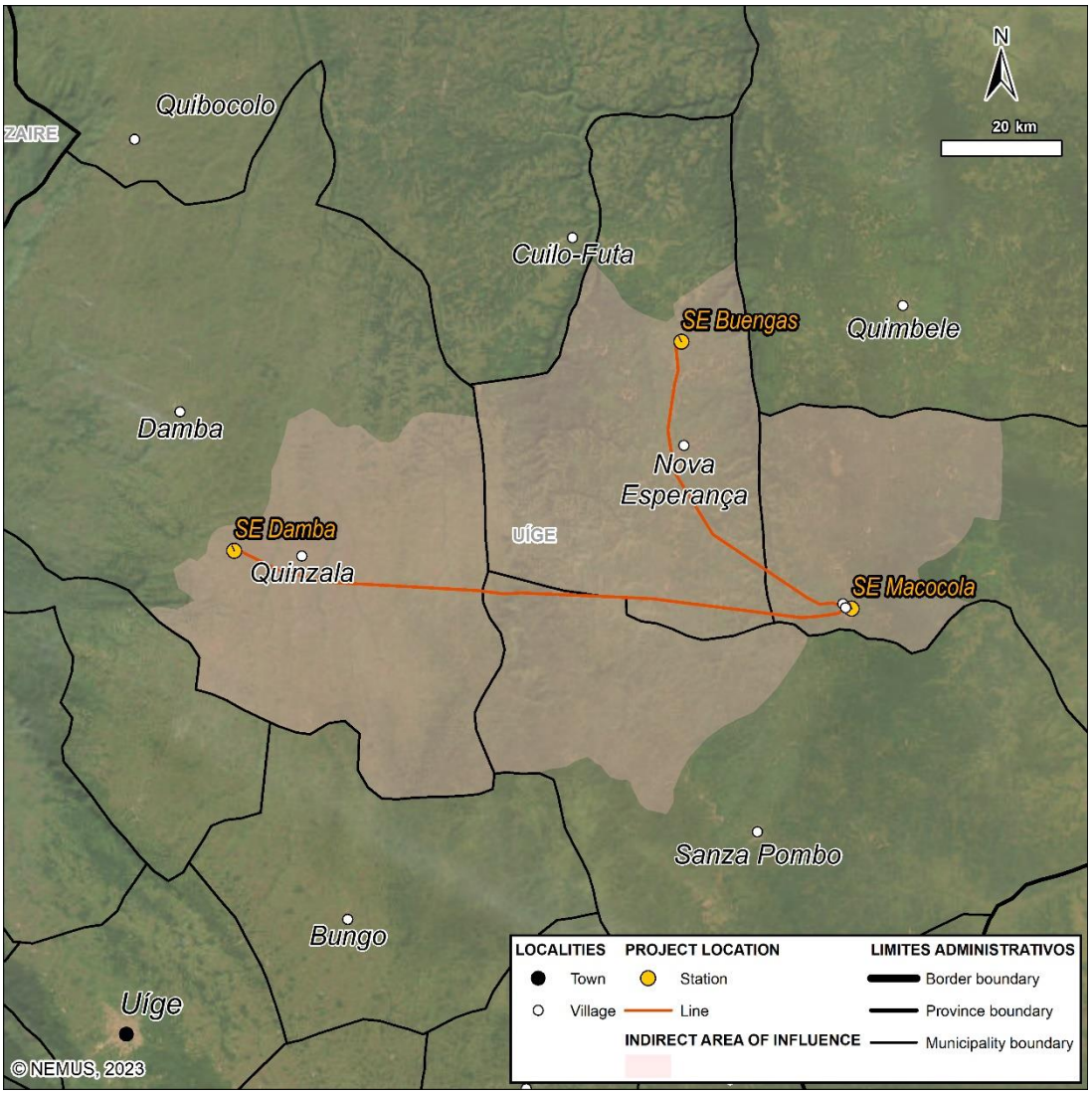

Figure 2 – Implementation and components of the Electrification Project of Uíge Province – Lot 1, Phase 2

2.4. Project design guidelines

The Project final layout was projected based on both national and international regulations and best practices. When there are no national standards that address certain issues, international guidelines are applied, namely the International Finance Corporation (IFC) Performance Standards on the Environmental and Social Sustainability and the Environmental, Health and Safety Guidelines.

2.5. Time schedule

The phase of Lot 1 total construction is **expected to last 15 months**, distributed as follows:

- 110 kV Damba-Milunga (Macocola) transmission line – 451 days;
- 60 kV Macocola-Buengas transmission line – 451 days;
- Macocola and Milunga SS, low-voltage network, household connections and public lighting – 446 days;
- Buengas SS, low-voltage network, household connections and public lighting – 411 days;

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3. Summary of the biophysical and socio-economic characterisation

This chapter presents a summary of the biophysical and socio-economic characterisation of the project's influence area (Table 2). This summary refers to the description of the affected environment of the project site for each descriptor addressed by Volume 1 of the Environmental and Social Impact Assessment.

Table 2 – Summary of the biophysical and socioeconomic characterisation

Subject	Characterisation summary
Climate	• The project is located in a region classified as having a tropical savannah **climate**, characterized by average temperatures in the coldest month of more than 18 ºC. • In Uíge, the average monthly air temperature varies between 20 ºC and 25 ºC. The summer months (from May to September) are particularly dry due to high temperatures and low precipitation values. The winter months (October to April) are characterised by high precipitation. The average annual precipitation between 2000 and 2021 was 1 443 mm.
Geology, geomorphology, and topography	• The **geology** of the project comprises exclusively sedimentary rocks of Mesozoic (Cretaceous) to Quaternary age, the latter corresponding to detrital sedimentary rocks deposited along the main watercourses crossed by the project. • Regarding **geomorphology**, the project covers 1 of the 11 geomorphological units in which Angola is subdivided, the Congo Peneplain. • The region presents a high **topography**, with approximately 92% of the territory with altitudes between 850 and 1 150 m above sea level. About 72% of the study area has a gentle (3% to 8%) to wavy relief (8% a 16%). The flat areas occupy approximately 18% of the territory under study, while 10% is moderately accentuated (> 25%).

Subject	Characterisation summary
Mineral resources	• Angola has significant potential for **mineral resources**. • In the project's area of influence, no relevant mineral reserves have been identified. • In Damba there are prospecting and research works for galena mines. However, there is no information available on the area allocated for this exploration work
Natural disasters	• The project area presents a low risk of **seismicity**. • In the provinces covered by the project, the relief is classified as gentle to undulating and the flattened areas make the susceptibility to **slope instability** low to very low. • During the technical field visit, several situations of severe landslides were observed in Buengas, Macocola, Damba and Milunga. In the specific case of Macocola, it was observed, already at the end of the route, a subsidence of the land of large dimensions, causing the collapse of the road.
Hydrogeology	• It is possible to identify two different types of **hydrogeological units**: porous/fractured aquifers, related to consolidated Cretaceous and Tertiary sediments, and porous aquifers, supported by alluvial deposits.
Surface water resources	• The project's area of influence covers the Cuango and Northwest **hydrographic units**. • **Water uses** comprise human supply, irrigation and livestock, with urban supply predominating. • Due to the urban occupation of the banks, during the rainy season, local flooding is also recorded along the water lines in the municipality of Uíge.
Soils and Land use	• In the region, the predominant **soils** are ferrous Arenosols, soils with a sandy-to-sandy loam texture, strongly altered, derived from unconsolidated materials and with high concentrations of iron. • Tree cover and grassland areas are the main **land use** classes.

Subject	Characterisation summary
Quality of the environment	• The results of particle monitoring indicate worse **air quality** in urban areas than in rural areas, due to the higher frequency and intensity of air pollutant bridges related to road traffic, biomass burning and the use of generators. • **Noise** monitoring reveals that without the influence of the project activities, the area of study is already a noisy zone due to road traffic and daytime activities of the population.
Ecology	• The project's direct area of influence is located in a transition zone between the tropical rainforest region and the arid Zambezian region. • The landscape is largely anthropized and is currently dominated by savannah vegetation. • The landscape is intersected by formations of greater complexity and ecological value, such as riverine forests, in the valleys, and palustrine meadows.
Socioeconomics and Human Rights	• With regard to **socioeconomics and human rights**, the rurality of the province of Uíge, where various agriculture, animal production, hunting, forestry and fishing businesses are concentrated, should be noted. • It is estimated that about 1,9 thousand people live in the project area, of which it is estimated that only 6,6% live within the project's 60 metre border. • Approximately 80% of the households in the settlements affected by the project are socially vulnerable, as most are heavily dependent on the land for subsistence and income generation, and have low monetary incomes. • In Uíge province, only 17% of the population has access to the public power grid and uses energy for lighting. • Living standards in Angola, in general, and in rural areas, in particular (as is the case in the project's area of influence) are unsatisfactory, so that the right to an adequate standard of living (including access to health care, food and adequate housing), the right to education, and workers' rights are compromised and limited.
Cultural heritage	• Currently there are no known heritage incidents in the direct area of influence of the project.

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4. Identification and Evaluation of Environmental and Social Impacts

This is one of the most critical phases of the Environmental and Social Impact Assessment (ESIA), through which the main effects/impacts of the project are identified and assessed. The main objective is to identify the environmental, social and heritage impacts associated with the project on and around the site, including direct and indirect, short and long-term impacts, focusing on both positive and negative impacts associated with the different phases of implementation.

The effects/impacts of the project were assessed using certain criteria, resulting in the prediction of their significance: the value of an impact is understood to be positive (enhancement of the environment), negative (devaluation) or null (no effect); the significance of an impact translates the ecological, environmental or social ecological, environmental or social significance (ranging from negligible to high significance) this is the most important descriptive criterion. Significance is influenced by other assessment criteria, particularly the regional extent, duration, likelihood and intensity of the impact.

Erro! A origem da referência não foi encontrada. presents the criteria used in the E SIA for the classification of the significance of project effects/impacts.

Table 3 – Impact significance criteria

Significance criteria	
Negligible significance	An impact of *negligible significance* is where the magnitude is negligible or low and the likelihood of the impact occurring is unlikely, or the magnitude is negligible and the impact probability is likely or definite.
Low significance	An impact of *low significance* is where the magnitude of the impact is low but the likelihood is probable or definite, or where the magnitude is moderate but the probability of occurrence is unlikely.
Moderate significance	An impact of *moderate significance* is where the magnitude is medium, and the probability of the impact occurring is likely or definite, or the magnitude is high but the probability is unlikely.
High significance	An impact of *high significance* is where the magnitude of the impact is high, and the probability of the impact occurring is likely or definite.

For the construction phase of the project, 25 impacts, of which 23 are negative impacts and 2 are positive impacts. The high number of negative impacts is related to construction activities, such as deforestation, excavations, vehicle traffic in the project area, operation of machinery and equipment, among other activities.

These actions will cause the following **negative impacts**, mostly temporary:

- Changes in local morphology due to excavations, landfill and soil erosion
- Temporary loss of access to land and crops;
- Pollution of surface and underground water resources, mineral deposits and soil due to possible accidental spillages of contaminating substances;
- Noise and dust emission from construction activities;
- Greenhouse gas emissions and reduction of carbon sinks;
- Elimination/loss of habitats, vegetation and flora;
- Different impacts on local communities, such as loss of livelihood due to occupation/impeded access to farmland, affecting the safety and health of people close to the works, increased transmission of diseases in the local community due to increased interaction with workers;
- Interference with cultural heritage not currently recorded and which may be identified during the works (e.g., traditional burial grounds).

To minimise the negative impacts of this phase of the project, a list of mitigation measures is presented with the objective of reducing the intensity and significance of the impacts.

Positive impacts will also be registered during the construction phase, mainly at the socioeconomic level, namely through the temporary creation of jobs and new opportunities for local businesses in terms of local income, increased commercial activities, the empowerment of local contractors and suppliers, among other indirect benefits. The construction will create about 223 jobs in total, 171 for the electrification of the municipalities and 52 for the home connections and public lighting (direct and indirect labour needed).

The operation phase will clearly bring the main **positive impacts** of the project, mostly associated with socioeconomic aspects, but also some contributing to climate change mitigation. These impacts result from:

- Increased electrical capacity and benefits related to a more stable and secure electricity supply;
- Increased safety and comfort of the population with public lighting;
- Increased local employment opportunity generated by the need to maintain the transmission line corridor and associated infrastructure;
- Increase in community safety after mine-clearance;
- Benefits for local settlements arising from the improvement of road infrastructures by allowing greater road safety and better access to education, employment, health, among others;
- Reduction of greenhouse gas emissions contributing to climate change due to increased electricity consumption in Uíge Province in the project area.

In the operation phase of the project, it is expected that a few **negative impacts** will occur:

- Degradation of the conservation status/fragmentation/loss of habitats in the area affected by the transmission line protection strip (with thinning and clearing of vegetation);
- Disturbance to animals (mammals and birds) due to the risk of electrocution and collision with the transmission line and increased human pressure;
- Restrictions to land use and loss of livelihood due to occupation/impeded access to farmland;
- Noise generated by substations and electrical discharges from transmission lines.

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5. Mitigation and Compensation Measures

For a good environmental performance of the project, it is essential that in all phases of the project where negative effects/impacts were identified, mitigation measures are implemented and positive effects/impacts are enhanced.

In the Environmental and Social Impact Assessment general mitigation measures are presented, mainly related to the construction activities, namely with the management of the construction yards, machinery operation, transport and execution of the works. Most of these measures correspond to recommendations on good environmental practices and on the strategy thought to be the best to guarantee the sustainable implementation of the project.

Of all the proposed measures, the following have the greatest benefit for the interests of the communities surrounding the project area and their environment:

- Articulation of the project with possible areas of mineral interest that may come to light following the galena prospecting and research work;
- Whenever possible, the line should be constructed as a priority in modified habitats so as to minimise the fragmentation of habitats, ensuring their spatial continuity;
- Avoid crossing dominant tree habitats, which include endangered tree species;
- Avoid that the towers or poles are located in valleys (the “lows”), where riverside forests develop;
- In forest areas, the work should be preceded by a specialised technician (biologist) driving the animals away. In the second phase, an active search of the treetops should be carried out to detect less mobile or vulnerable animals (injured, injured or juvenile animals) for rescue;
- Reinforcing the monitoring and maintenance of the line in areas of potential occurrence of primates;
- Implementation of actions to raise workers’ awareness of environmental conditions, cultural heritage, soil protection and prevention of pollution of water resources;
- Planning activities with the highest potential for the emission of dust and inhalable particles and noise to take place as far away as possible from sensitive receptors (places where people live or stay);
- Prevent local communities from potential disruption to air quality and noise;

- Ensure the hiring of workers from rural communes in the direct catchment area whenever possible for the project's construction activities, contributing to reduce local unemployment and boosting local economies;
- Elaboration of an Action to Sensitise workers to the cultural heritage. The different types of heritage that may occur in the construction area, their cultural value, the actions that lead to their destruction and the risks that their destruction will cause to the identity of the local community or to the country itself must be explained;
- Economic compensation for the loss of income opportunities from seasonal and permanent crops, as well as the loss of community resources such as firewood and charcoal collection;
- Sealing off access to traditional burial grounds and sacred forests that may be identified in the course of the works.

6. Conclusions

The Environmental and Social Impact Assessment (ESIA) concludes that the project is viable from an environmental point of view, presenting a set of **positive effects/impacts of moderate to high significance**, constituting an opportunity for social and strategic development.

The positive impacts are mainly associated with the operation phase, with the increase in electricity capacity and the benefits inherent in a stable and secure supply of electricity and public lighting, the creation of jobs, the stimulation of economic activities, but also by the project's contribution to mitigating climate change due to the substitution of electricity generated from fossil fuels (diesel) by electricity generated from hydroelectric plants with lower greenhouse gas emissions.

Although negative environmental and social impacts have been identified in the construction and operation phases, these are generally minimizable.

The ESIA indicates a greater number of negative effects/impacts during the construction phase, most of them temporary and mitigable with the implementation of the proposed mitigation measures. Most of the recorded impacts are common to any construction work of this nature, such as the emission of noise and dust, the affectation of plots of land or local increase in traffic, so that the adoption of the set of general mitigation measures usually applicable to construction works, as well as the implementation of specific measures presented by the different factors assessed, will be essential to ensure the implementation of the project within a framework of environmental sustainability.

The most significant negative impacts result from the elimination/loss of forest areas along the corridors intended for the protection of structures and cables, but also by the disturbance of animals due to human presence and by an increased risk of electrocution and collision with the lines.

Negative impacts related to restrictions on land use and loss of livelihoods due to occupation/impeded access to farmland were also identified, in most cases mitigable, and therefore of low significance, if the measures recommended in the Environmental and Social Impact Assessment are adopted.

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