

**Non-Technical Summary (NTS) of the Environmental and Social Impact Assessment (ESIA) for Laúca-Bita Transmission Line, Angola**

February 2019

## 1.0 INTRODUCTION

### 1.1 Project Background

In August 2017, the Ministry of Energy and Water of Angola (*Ministério da Energia e Águas* - MINEA) awarded New Horizons in Infrastructure of Denmark (NHID) the contract for the design, construction and commissioning of the infrastructure for the Laúca-Bita transmission line (the "Project"), transporting energy from the Laúca River hydroelectric power station to a new substation to be built in Bita, near Luanda. The Project is aligned with the Government of Angola's strategy to identify priority investments in generation, transmission, and interconnection, as well as distribution and network expansion (Angola Energy 2025).

The Project consists of the following main components:

- 238 km 400 kV overhead transmission line connecting the 400 kV substation of the Laúca hydroelectric power station to a new substation (Bita) to be built; and
- Two 7.5 km 220 kV overhead transmission lines connecting the 220 kV substation of the Laúca hydroelectric power station to the existing Cambutas - Capanda transmission line that connects the Capanda hydroelectric power station with the Cambambe hydroelectric power station.

An Environmental and Social Impact Assessment (ESIA) has been undertaken of the final transmission line route alignment that was approved by GAMEK (*Gabinete de Aproveitamento do Médio Kwanza*) in December 2018. The ESIA process involved the identification, prediction and evaluation of potential environmental and social impacts of the Project and outlines the proposed mitigation measures to manage predicted adverse impacts, as well as enhancement measures for positive impacts.

### 1.2 This document

This Non -Technical Summary (NTS) provides an overview of the full ESIA and can be used as a stand-alone document during the stakeholder engagement process.

The NTS is a short document written in non-technical language that can be used to share the findings of the ESIA to the general public.

### 1.3 Resettlement and Compensation Action Plan

The Project has also developed plans to mitigate adverse socioeconomic impacts arising from any necessary land acquisition or restrictions on affected persons' use of or access to land, including physical displacement, in a manner that meets the IFC PS as well as Angolan legislation. These plans are captured in a Resettlement and Compensation Action Plan (RCAP). This RCAP provides a framework for any necessary land acquisition, compensation and livelihood restoration to avoid or minimizes adverse socioeconomic impacts arising from the Project-related land acquisition or access restrictions. It will be implemented during the detailed design (Executive Project) and throughout construction.

## 2.0 PROJECT DESCRIPTION

### 2.1 Project Location

Figure 1 shows the proposed route of the Project and its context within Angola. The Project crosses three provinces and six municipalities; Malanje (Cacuso municipality), Kwanza Norte (Cambambe municipality) and Luanda (Ícolo, Bengo, Viana and Belas municipalities).

The 400 kV overhead TL (238 km) will connect the 400 kV substation of the Laúca hydroelectric power station and dam to a new substation (Bita) to be built close to Luanda. The 220 kV overhead TL (two parallel lines – each of 7.5 km in length) sectioning will connect the 220 kV substation of the Laúca hydroelectric power station to the existing transmission line, Cambutas- Capanda that connects the Capanda hydroelectric power station and dam with the Cambambe hydroelectric power station and dam.

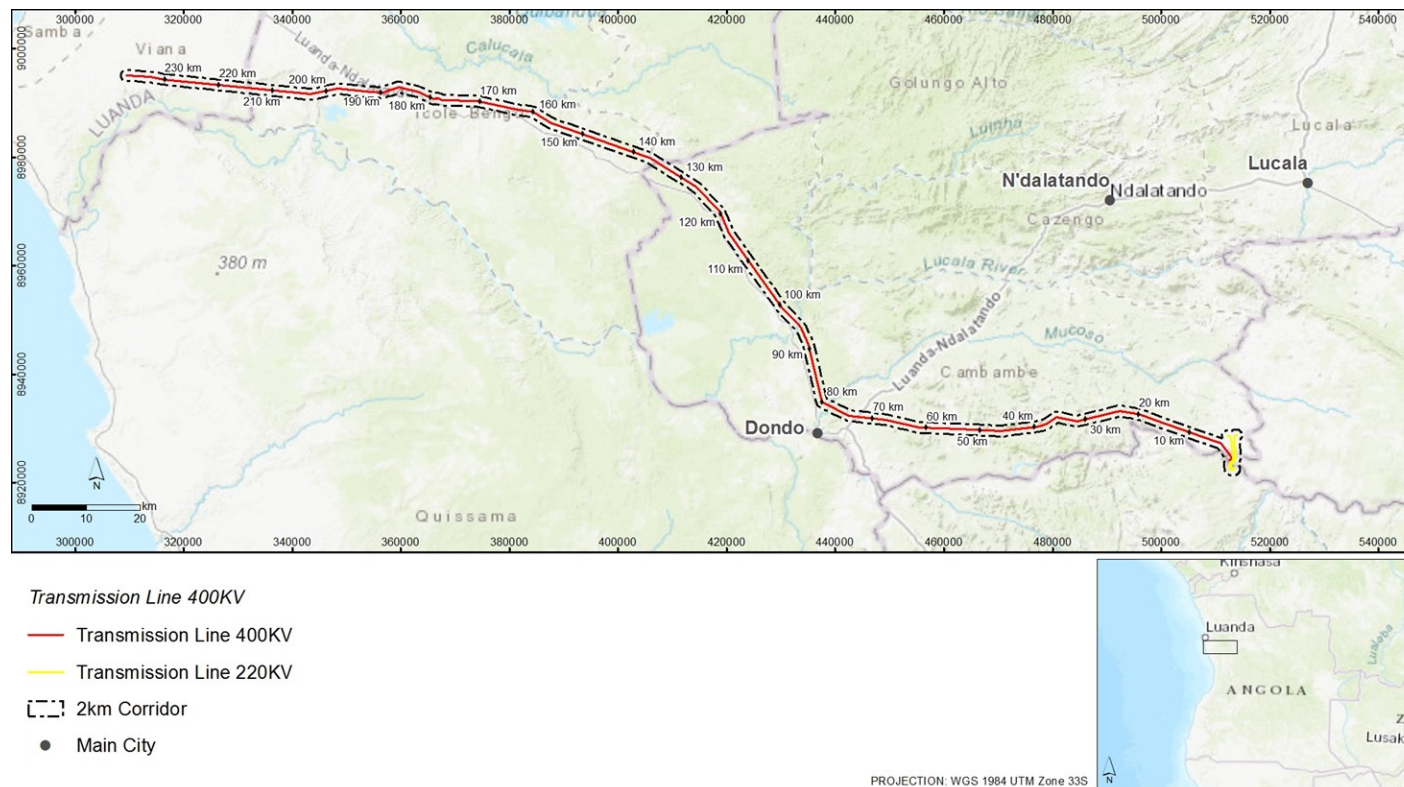
The current route for the Project is considered to be the preferred selection based on a ranking of potential environmental and social impacts and sensitivities and consideration of alternatives. This is further described in Section 3 (Alternative Analysis) of this NTS.

### 2.2 Project Justification

Some cities in Angola are still subject to unplanned outages which lead to public dismay and disruptions to businesses and industry activities. The socio-economic implications of an intermittent supply of energy is most severe in densely populated areas, like Luanda. The Government of Angola issued the national power sector long term vision in 2017 (Angola Energy 2025). This assessed the main long term options and established the Government's vision for the development of the electricity sector between 2018-2025, identifying priority investments in generation, transmission and interconnection, as well as the distribution and network expansion model.

Substantial investment is being allocated to the construction and rehabilitation of hydropower projects. As per the biophysical characteristics of Angola, the Middle Cuanza Basin has been identified as a key area for development of hydropower projects to provide electricity to support the growth and development of the Country. The Project connects this source of electricity to the national grid, in particular to Luanda.

Figure 1 Project Location:



## 2.3 Project Components

A brief description of the Project components are described in Table 1.

**Table 1. Main Transmission Line Components**

Project technical Specifications	400 kV Laúca - Bita	220 kV Laúca – Cambutas / Capan-
Total length of transmission line	238 km in total length, one-circuit, duplex	15 km in total length, double-circuit, simplex
Nominal System voltage	400 kV	220 kV
Maximum system voltage	420 kV	245 kV
Electrical System	Alternate	Alternate
Number of circuits	1 three phases	1 three phases
Number of conductors phase	2 (Dx)	1 (Sx)
Circuit layout	Layer	Layer
Wire	Sorbus (AAAC)	Crow (ACSR)
Ground wire	19No8	19No8
Optical Ground Wire (OPGW)	48 fibres	48 fibres
Transpositions	2	No
Height above the sea level	11 – 870 m	733 – 952 m

The Project design will also include the following elements:

- Lightning Arrestors: two ground wires, on top of the power line for the entire 238 km length to protect the conductors;
- Beacons for aircraft signalling;
- Bird diverters on the guard cables to increase visibility of cables by birds; and
- Vibration dampers (one every 200 m on all cables);
- Temporary access roads during construction;
- Temporary tower laydown and assembly areas (40x50m area); and
- Use of existing construction camps (Laúca dam, Dondo, Maria Teresa and Catete), with approximately 150 workers housed at each.

## 2.4 The Temporal Scope

The Project will be divided into three key phases: construction, operation and decommissioning.

The construction period will last for 12 to 18 months, and efforts will be made to shorten this schedule to a minimum of 10 months of preconstruction activities and 12 months of construction works. To achieve this goal, construction works will be divided into three teams operating simultaneously.

Many of the adverse environmental impacts predicted for this Project will occur only during the construction phase.

The operational phase of the Project will be approximately 50 years.

Following the operational phase, a decommissioning procedure will be provided as part of the maintenance manual during handover of the completed Project. However, at this stage it is unknown whether NHID or GAMEK will execute this. The decommissioning procedure will include site specific rehabilitation plans for the footprint of the project. All regulatory requirements will be complied with for the decommissioning phase.

## 2.5 The Physical Scope

The proposed transmission line route is provided in *Figure 1*.

Currently the route is approved and alignment fixed. Project layout was considered by MINEA as fully compliant with national regulations and both national and international engineering best practices. NHID team is now developing the detailed design (Executive Project) and topographic surveys (LIDAR) as well as geotechnical on-site surveys are currently being planned. Whilst the indicative route is agreed, the detail design (including exact tower heights and their foundations) will be dependent on the results of these surveys and the mitigation proposed to minimise social and environmental impacts during this process. Mine clearance of the proposed route will be also required.

For the purposes of this assessment, the area of influence where direct impacts are predicted to occur is within 1000 m of the transmission lines. Not all impacts will occur within this entire zone, but this 1000 m zone is considered to be the composite area of potential direct impacts from the Project.

In addition to the direct area of influence, indirect impacts may also occur beyond this zone. These include the indirect impacts that may extend to nearby communities along the transmission lines (*i.e.* Cambambe, Icolo e Bengo and Viana), as well as the residents in the Luanda metropolitan area that will benefit from the electricity supply.

Whilst the exact location of the temporary infrastructure (*i.e.* roads, laydown/ assembly areas, and camps) is not yet know, it is assumed that they will be located within the direct area of influence considered in the assessment, *i.e.* within the already mentioned 1000 m zone of the transmission lines.

### 3.0 ALTERNATIVES ANALYSIS

#### 3.1 Introduction

The purpose of the alternatives analysis was to identify feasible alternatives that could improve the sustainability of the Project's design, construction and operation.

To minimize environmental and social impacts, a significant portion of the transmission line route will be located within an existing transmission line corridor. There will however be a need in some areas to expand outside these existing corridors or extend them. As part of the design process, NHID investigated various options to minimize the impact on the public and the environment.

The key environmental, social, technical and economic factors were evaluated and considered based on the following criteria:

- Location alternatives - Where possible, re-route the transmission lines so that no structures/properties were close to or under the lines (re-siting the facilities). Resettlement would be considered as a last option; and
- Technology alternatives - Should re-routing not be an option due to space or other factors, consideration of different technologies (e.g. transmission towers height) would be investigated. These options were evaluated against EHS, technical and economic criteria.

Consequently, both siting alternatives and technology were evaluated individually and in combination, as follows:

- From an environmental, health, safety and social perspective (environmental issues, need for any resettlement including physical as well as economic displacement, health concerns, community safety and aesthetics);
- From a technical perspective (constructability, impacts on timing and schedule for construction, maintenance / repair of infrastructure, making changes to infrastructure, disturbance to other infrastructure and accidental damage); and
- From an economic feasibility perspective (construction costs, maintenance costs and resettlement costs).

#### 3.2 No-Go Scenario

Based on this scenario, the no-development option would mean that this component of the national strategy would not be fully implemented despite the energy generation upstream. In the short term, this scenario ensures the status quo in the biophysical and socio environment along the project area, considering that the majority of the line is being planned within existing corridors.

#### 3.3 400 kV Transmission Line

Three route options were evaluated (see *Figure 2* on the next page):

- 2014 route as described in the original ESIA approved by MINAMB (Option 1);
- 2017 route developed following further refinement (Option 2); and
- 2018 route following even further refinement and the route that is evaluated in this ESIA (Option 3).

In terms of environmental context the differences between the three considered alternatives was not that significant. However using the ranking, Option 3 was preferred from an environmental and social perspective. The factors that influenced the evaluation were, among others: need for vegetation clearing (as some route alternatives are almost entirely within the existing 800m corridor); water bodies crossing; and proximity to sensitive receptors (for air quality and noise).

With regards to social factors, Option 3 was identified as the preferred option, as it avoids areas where physical resettlement would be required in particular the villages of Muchau and Kissuba in Cambambe municipality.

#### 3.4 220 kV Transmission Line

Two route options were evaluated: Option 1 (2014 TL route) and Option 2 (2018 TL route). As there are no major differences in terms of project layout between the 2017 and 2018 routes (both considered the connection 220 kV Laúca substation - Cambutas / Capanda Transmission Line (7.5 Km)) these two routes were considered as one option ('Option 2').

For both options (1 & 2), the environmental and social sensitivity, as well as potential health and community safety risks were identified as generally low. However the preferred route was Option 2 as this option relies on the extension of the existing infrastructure and would be developed on a less sensitive area of land. The results were similar for the technical and financial aspects showing a preference for Option 2.

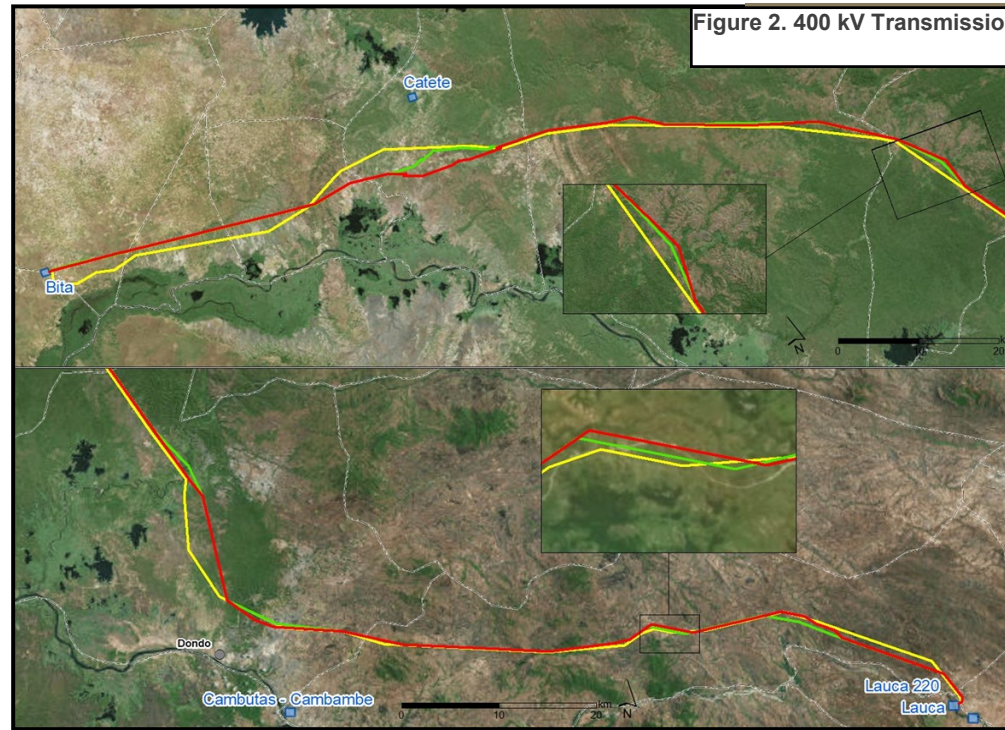


Figure 2. 400 kV Transmission

Figure 2, to the left, shows the three route options assessed for the 400 kV transmission line.

Figure 3, below, shows the two route options assessed for the 220 kV transmission line.

- Option 1 (2014)
- Transmission Line V1 (2014 Route)
- Option 2 (2017)
- Transmission Line 400KV (2017 Route)
- Option 3 (2018)
- Transmission Line 400KV (2018 Version)
- Existing Substation
- Main City
- Commune



Figure 3. 220kV Transmission

- Option 1 (2014)
- Capanda - Laúca Line
- Transmission Line 220KV
- Option 2 (2017)
- Cambutas - Capanda Line
- Transmission Line 220KV
- Option 3 (2018)
- Cambutas - Capanda Line
- Transmission Line 220KV
- Main City
- Commune

#### 4.0 LEGAL AND ADMINISTRATIVE FRAMEWORK

##### Lender Requirements (IFC Performance Standards)

The Performance Standards specify the IFC's conditions for environmental and social performance for projects seeking external financing. The IFC Performance Standards are divided into eight categories to identify and evaluate the potential environmental and social impacts which may occur as a result of project activities. A summary of the scope of the IFC Performance Standards and the applicability to the Project is provided below. As indicated, impacts on Indigenous Peoples were not identified.

N°	Title	Scope	Applicable to the Project
1	Assessment and Management of Social and Environmental Risks and Impacts	Defines requirements for ensuring appropriate environmental and social management policy implementation and accountability, including Environmental and Social Impact Assessment requirements	✓
2	Labor and Working Conditions	Defines requirements for ensuring definition and implementation of fair recruitment and workforce management policies	✓
3	Resource Efficiency and Pollution Prevention	Defines requirements for ensuring an appropriate level of pollution prevention and abatement	✓
4	Community Health, Safety and Security	Defines requirements for ensuring that adverse impacts from the Project on the receiving community are managed and controlled	✓
5	Land Acquisition and Involuntary Resettlement	Defines requirements for land tenure management and community resettlement as part of Project development	✓
6	Biodiversity Conservation and Sustainable Management of Living Natural Resource	Defines requirements for ensuring that the Project's impacts on nature, ecosystems, habitats and biodiversity are appropriately managed	✓
7	Indigenous Peoples	Defines requirements for ensuring that the rights of autochthonous minorities are respected and that indigenous people may benefit from the Project	✗
8	Cultural Heritage	Defines requirements for managing the Project's impacts on material and immaterial cultural heritage	✓

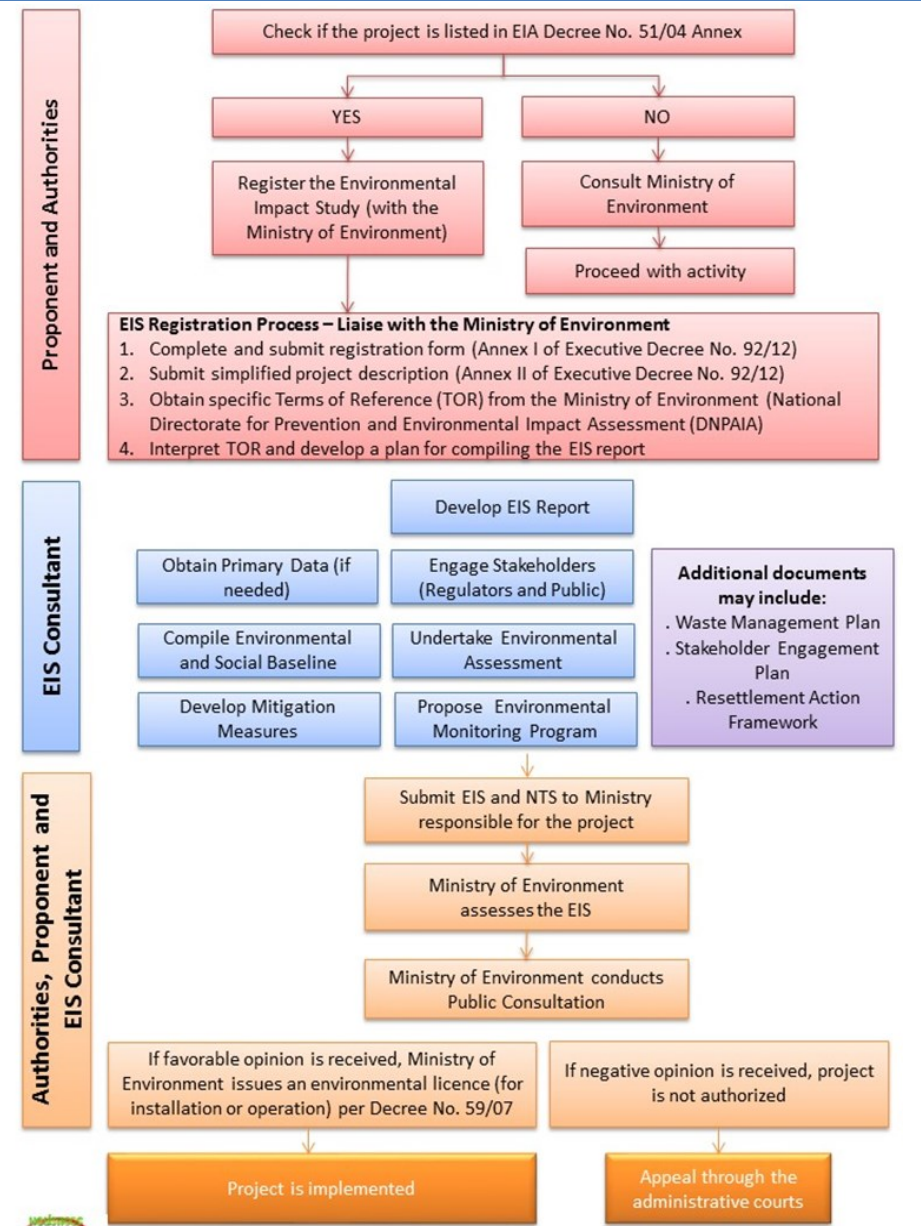
##### Lender Requirements (World Bank/IFC EHS Guidelines)

The EHS Guidelines are technical reference documents, providing general and industry-specific examples of good practice. They are used as part of the appraisal of projects under the IFC's project evaluation mandate as described in the IFC's Environmental and Social Review Procedures Manual. The EHS Guidelines represent the measures normally considered acceptable by the IFC, and generally considered to be achievable in new facilities at reasonable cost by existing technology. When host country regulations differ from the levels and measures presented in the EHS Guidelines, the IFC recommends that projects should achieve whichever is more stringent. The EHS Guidelines include general overarching guidelines as well as industry specific guidelines.

The EHS Guidelines considered relevant to the Project are:

- Environmental, Health & Safety General Guidelines (2007)
- Electric Power Transmission and Distribution (2007)

##### Angola EIS Process



Source: Holisticos, 2016

## 5.0 ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT METHODOLOGY

### Overview

The purpose of the impact assessment process was to identify any likely significant effects on receptors/resources as a result of impacts from a Project and develop appropriate mitigation measures to effectively manage these environmental and social effects. The process was iterative and can be summarized by the figure to the right.

The detailed impact assessment methodology that was used complies with international best practice for impact assessment. The overarching principles of this methodology are illustrated here, but note that each ESIA topic area have specific criteria for defining receptor sensitivity/vulnerability and impact magnitude.

### Evaluation of Significance

The significance of the potential effect on receptors/resources is determined through the combined consideration of:

- the sensitivity/vulnerability of the affected receptor/resource, and
- the magnitude of the potential impact.

Note that the term '**magnitude**' is used as shorthand to encompass various possible dimensions of the predicted impact, such as:

- the nature of the change (what is affected and how);
- its size, scale or intensity;
- its geographical extent and distribution;
- its duration, frequency, reversibility ; and
- where relevant, the probability of the impact occurring as a result of accidental or unplanned events.

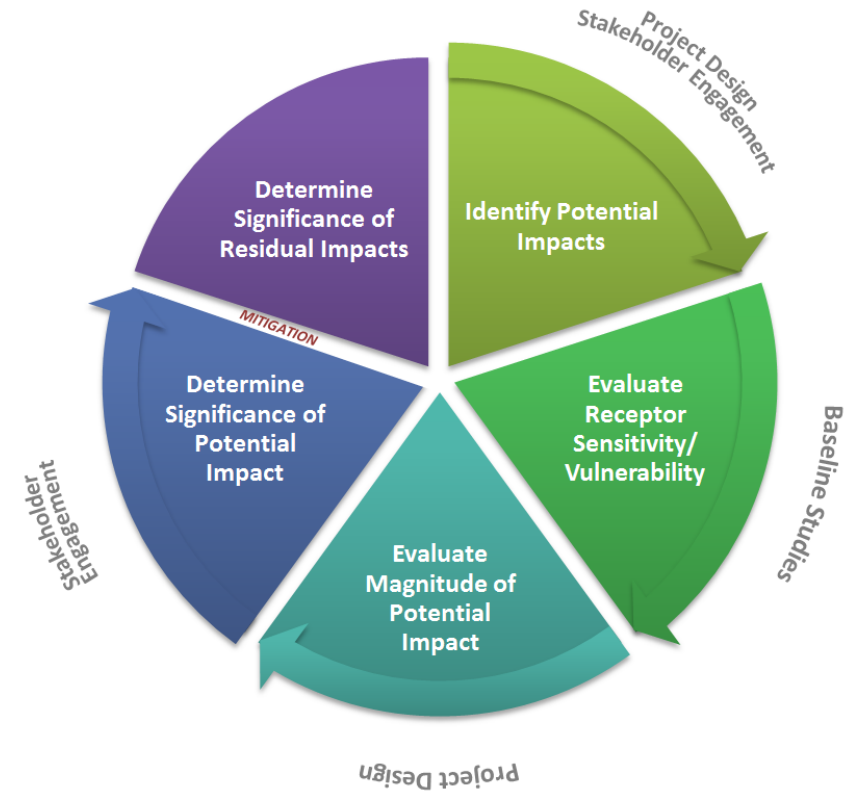
		Sensitivity/Vulnerability/Importance of Receptor or Resource		
		Low	Medium	High
Magnitude of Impact	Negligible	Not Significant	Not Significant	Not Significant
	Small	Not Significant	Minor	Moderate
	Medium	Minor	Moderate	Major
	Large	Moderate	Major	Major

There is no statutory or agreed definition of significance however, for the purposes of this assessment, the following practical definition is proposed:

*An impact will be judged to be significant if, in isolation or in combination with other impacts, the effects will be a notable change from baseline conditions and may require mitigation to management environmental/ social effects/risks.*

Magnitude and vulnerability/sensitivity will be looked at in combination to evaluate whether an impact is significant and if so its degree of significance. The principle is illustrated here.

The impact assessment process evaluates both beneficial and adverse impacts, however the magnitude rating is only assigned for adverse impacts.



### Residual Impacts/Effects

*Is it still significant?*

Once mitigation has been identified, a re-assessment of impacts was undertaken to determine the magnitude and significance of any residual effects (after mitigation) is undertaken. Consideration was also given as to whether the impacts have been reduced to as low as reasonably practicable (ALARP) and if any further mitigation of remaining significant effects is technically or financially feasible.



## 6.0 SCREENING AND SCOPING

### 6.1 Introduction

Potential impacts of the Project were identified through a process whereby the features and activities (both planned and unplanned) associated with the pre-construction, construction and operation of the Project were considered with respect to their potential impact on resources/receptors. Potential impacts have been classified in one of three categories:

- No interaction: where the Project is unlikely to interact with the resource/receptor;
- Interaction likely, but not likely to be significant: where there is likely to be an interaction, but the resultant impact is unlikely to change baseline conditions in an appreciable/detectable way; and
- Significant interaction: where there is likely to be an interaction, and the resultant impact has a reasonable potential to cause a significant effect on the resource/receptor.

The completed Potential Interactions Matrix is presented in Figure 4:

- The interactions that are colored white were ‘scoped out’ of further consideration in the impact assessment process as no interactions were expected
- The interactions that are colored grey have also been ‘scoped out’ as a result of further investigation which indicated based upon past experience and documented data that any such interactions are unlikely to be significant.
- The interactions that are shaded black were retained for further consideration in the impact assessment process.

Figure 4. Potential Interactions Matrix

Resources/Receptors	Environmental Resources											Socio/Economic Resources										
	Air Quality & Fugitive Emissions	Landscape & Visual Amenity	Water Quality and Resource (Surface & Ground)	Land Contamination	Noise & Vibration	Soil Erosion	Waste (Including Hazard Waste)	Change of Land Use	Geology & Topography	Avian Species	Fauna and Flora (Excluding Avian)	Ecosystem Services	Invasive/ Alien Species	Community Health and Safety	Occupational Health and Safety	Land and Livelihoods	Economy and Employment	Demographic Pattern	Access to Infrastructure & Services	Cultural Heritage	Electromagnetic Field	Cumulative Impact
<b>Project Activities/Hazards</b>																						
<b>Construction Phase</b>																						
Right of Way Clearance																						
Excavation Work																						
Equipment/Material/Worker Transport																						
Accidental Events (Spills/Uncontrolled Releases)																						
Waste Storage and Disposal																						
<b>Operation Phase</b>																						
Presence at Site																						
Ongoing Maintenance (including vegetation control)																						

7.0 SUMMARY OF BASELINE CONDITIONS

**Physical Environment and Landscape**

Potential for soil erosion along the proposed transmission line route varies from low to medium. The route corridor does not intersect any relevant protected landscape areas.

**Flora and Habitat**

No species on the IUCN Red List of Threatened Species were identified. No Critical Habitat was identified.

**Fauna**

No mammal species were observed during the survey of the route. A hooded vulture (*Necrosyrtes monachus*), which is listed as critically endangered by the IUCN Red List, was observed in the vicinity of the proposed line. No other fauna found in the survey are considered to be of conservation concern.

**Air Quality**

Several locations along the transmission line route are anticipated to have PM<sub>10</sub> and dust baseline elevated close to and above air quality standards.

**Cultural Heritage**

No cultural heritage sites found were inside of the project footprint and are unlikely to be affected by the proposed project. No burial sites have been observed or confirmed within the proposed corridor of the transmission line. No tangible structures have been identified within the route.

**Demographics and Population**

The most populated settlements along the transmission line are located in the western area (Tari and Mateia) with 3,500– 4,500 people. The least populated settlements, Dumbo Ya Pepe and Muchau, are in the eastern portion of the route close to Lauca station with <110 people. Both Quimundo and Portuguese are widely spoken. Women face higher levels of discrimination and inequality in terms of land access and, in rural areas, a lack of access to education and exclusion from decision-making. About 70% of the households across affected settlements are vulnerable to project impacts.

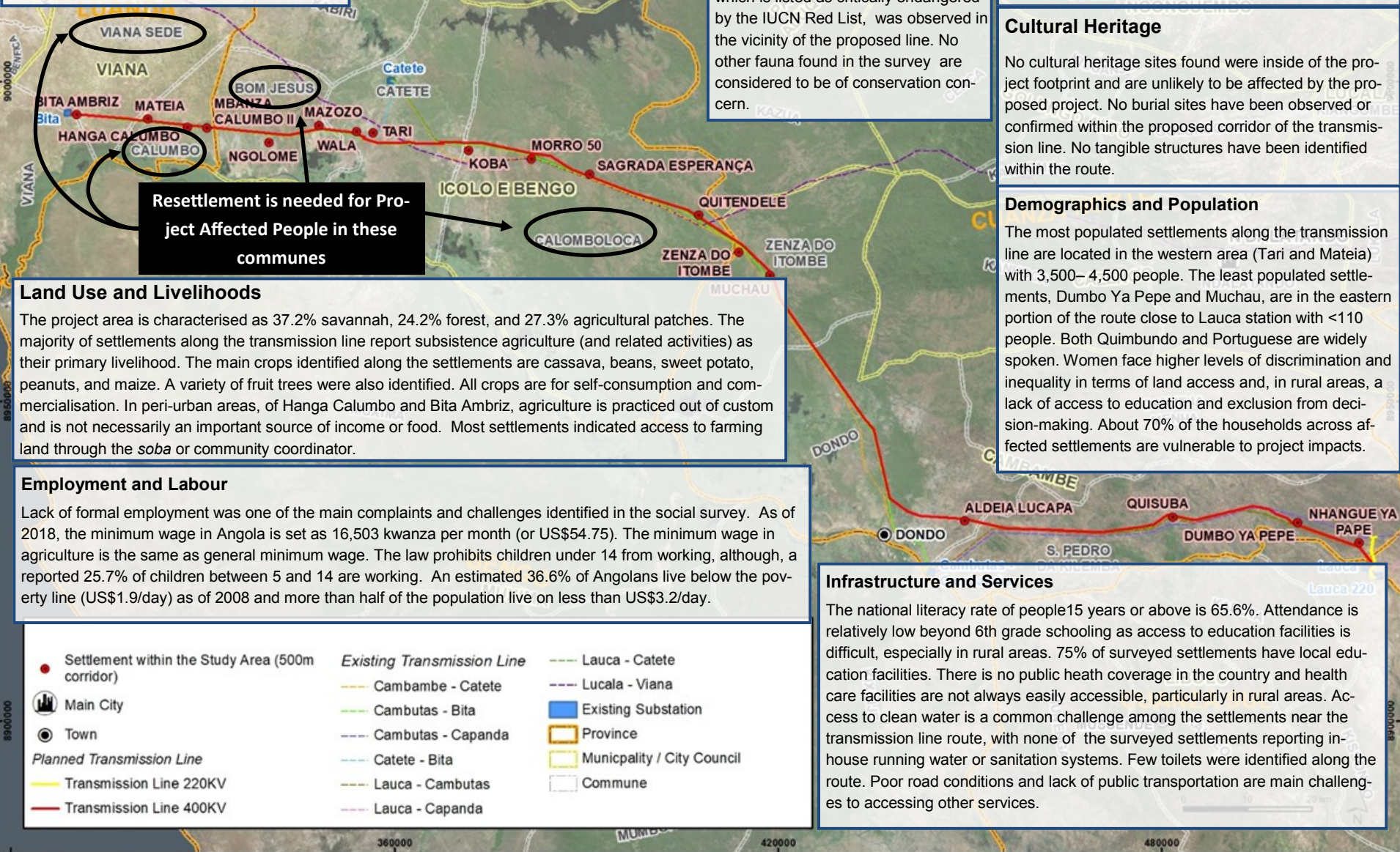
**Land Use and Livelihoods**

The project area is characterised as 37.2% savannah, 24.2% forest, and 27.3% agricultural patches. The majority of settlements along the transmission line report subsistence agriculture (and related activities) as their primary livelihood. The main crops identified along the settlements are cassava, beans, sweet potato, peanuts, and maize. A variety of fruit trees were also identified. All crops are for self-consumption and commercialisation. In peri-urban areas, of Hanga Calumbo and Bita Ambriz, agriculture is practiced out of custom and is not necessarily an important source of income or food. Most settlements indicated access to farming land through the *soba* or community coordinator.

**Employment and Labour**

Lack of formal employment was one of the main complaints and challenges identified in the social survey. As of 2018, the minimum wage in Angola is set as 16,503 kwanza per month (or US\$54.75). The minimum wage in agriculture is the same as general minimum wage. The law prohibits children under 14 from working, although, a reported 25.7% of children between 5 and 14 are working. An estimated 36.6% of Angolans live below the poverty line (US\$1.9/day) as of 2008 and more than half of the population live on less than US\$3.2/day.

Resettlement is needed for Project Affected People in these communes



**Infrastructure and Services**

The national literacy rate of people 15 years or above is 65.6%. Attendance is relatively low beyond 6th grade schooling as access to education facilities is difficult, especially in rural areas. 75% of surveyed settlements have local education facilities. There is no public health coverage in the country and health care facilities are not always easily accessible, particularly in rural areas. Access to clean water is a common challenge among the settlements near the transmission line route, with none of the surveyed settlements reporting in-house running water or sanitation systems. Few toilets were identified along the route. Poor road conditions and lack of public transportation are main challenges to accessing other services.

## 8.0 STAKEHOLDER ENGAGEMENT

### 8.1 Engagement During the 2018 ESIA Development

During the development of the 2014 and 2016 EIAs, engagement activities were undertaken consisting of public consultation organised by MINAMB following the EIAs. The results of this consultation was not available.

As part of the Project disclosure and social baseline data collection for the 2018 ESIA, extensive stakeholder engagement was undertaken, including Project disclosure engagement meetings with municipality and commune officials, and potentially affected community members. The objectives of the engagement process are illustrated in *Figure 5*.

Stakeholders identified for inclusion in engagement activities meet one of the following criteria:

- Have an interest in the Project;
- Would potentially be impacted by or have an influence on the Project (negatively or positively); and/or,
- Could provide commentary on issues and concerns related to the Project.

Engagement was undertaken between the 10th of July 2018 and the 3rd of August 2018 as well as social baseline data collection engagement activities:

**Participants:** Local Administration Authorities e.g., Local municipality, commune administrators and Sobas; Community (men, women and children).

**Activity description:** Official disclosure and consultation meeting, community meeting and consultation, Focus Group Discussion with community members, Key Informant Interview, and informal discussion with community representatives.

**Purpose:** Inform on the Project and survey, ground-truthing, village profiling and data collection.

Further details on the engagement activities are documented in the Project's Stakeholder Engagement Plan (Annex F).

### 8.2 Considerations for Future Stakeholder Engagement

The stakeholder engagement programme is designed to cover all phases of the Project. NHID will hand over the Project to *Rede Nacional de Transporte de Electricidade* (RNT) once the construction of the transmission lines is completed. NHID will have no responsibilities during the operation phase. Once the project is commissioned, MINEA-GAMEK will transfer the assets as well as the responsibility for RNT to fulfil IFC standards. In this regard, all engagement activities during the operation will be managed and promoted by RNT. The general objectives of stakeholder engagement are outlined in *Figure 6* on the next page

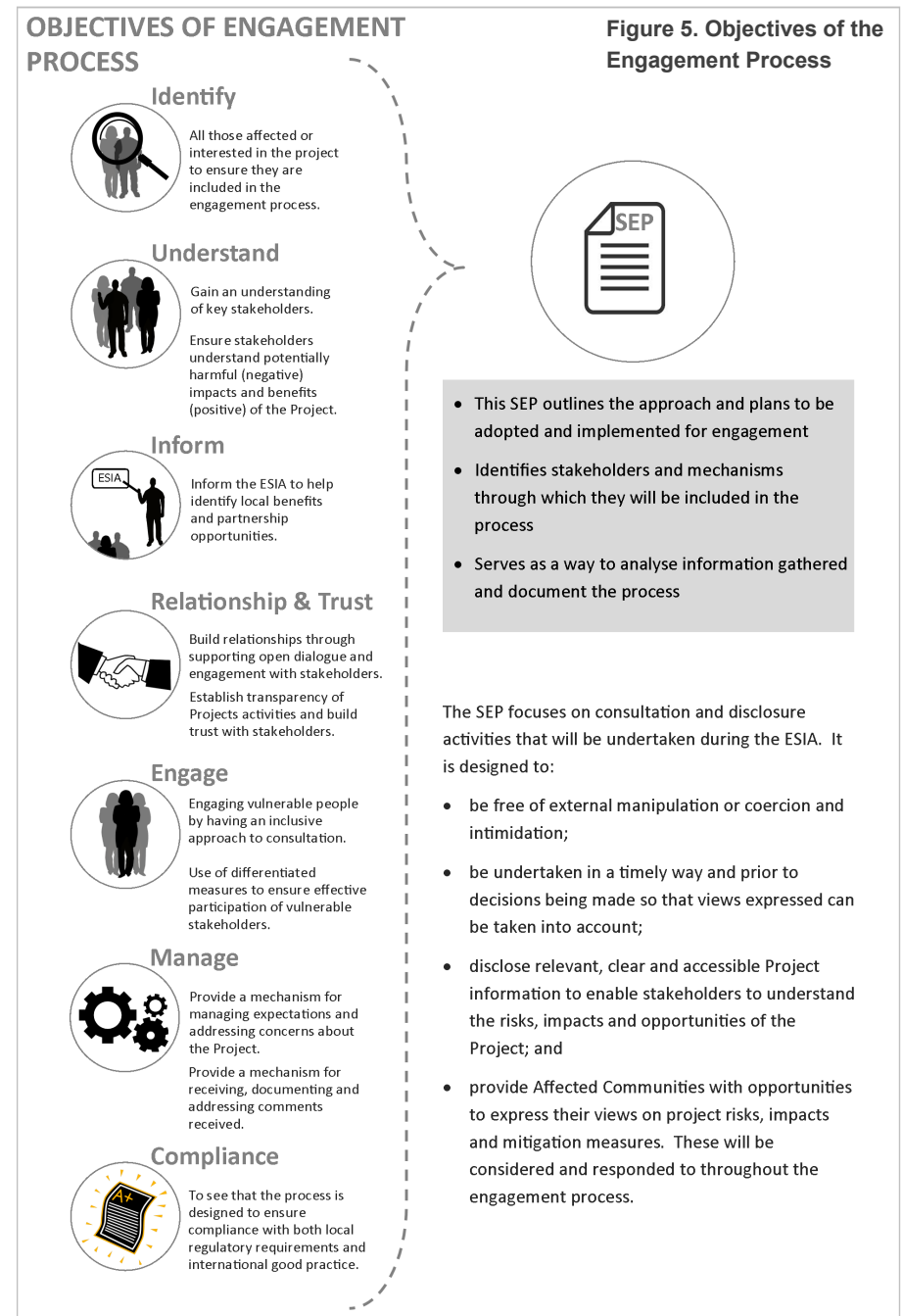
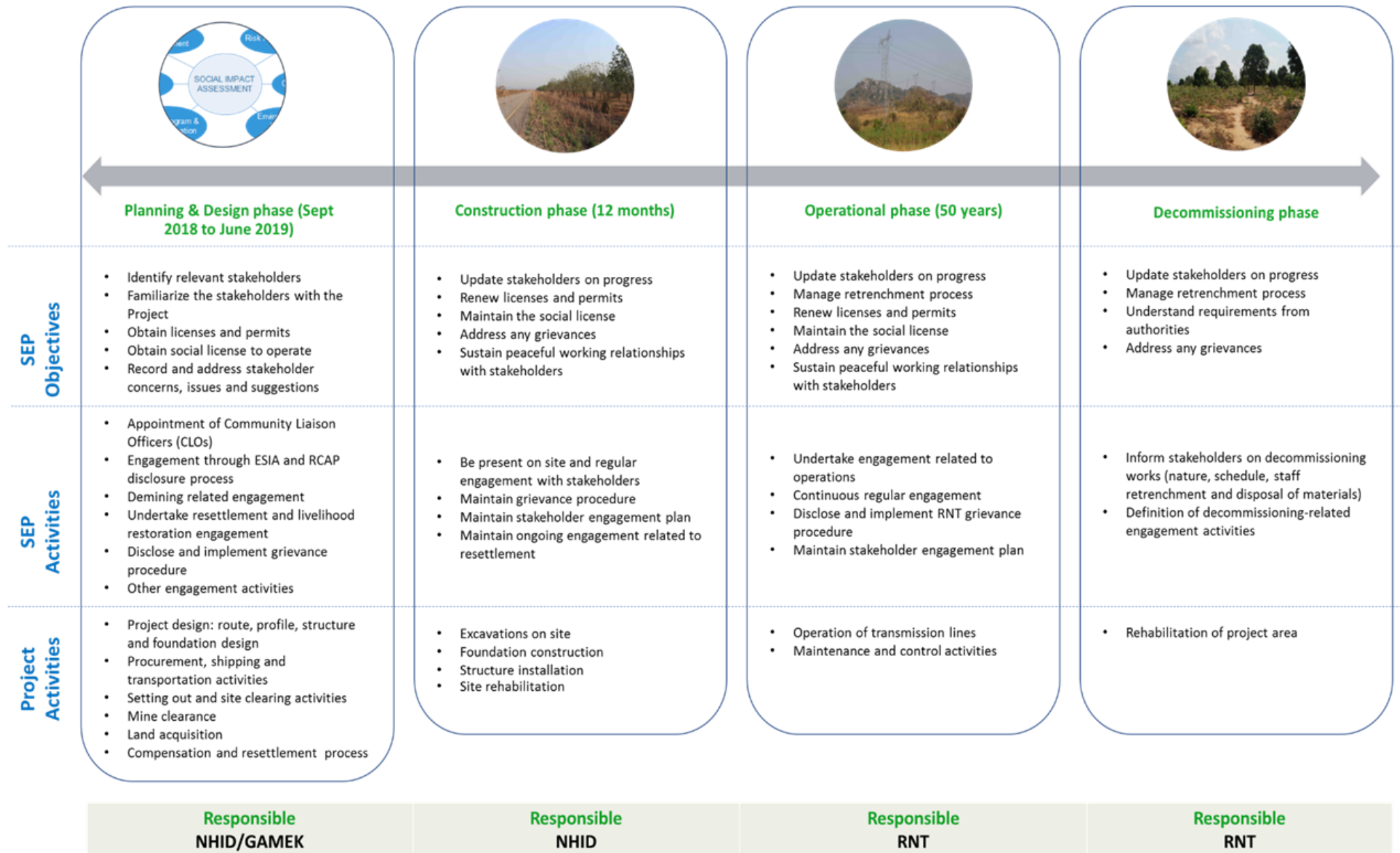


Figure 6. Summary of Stakeholder Engagement Objectives and Activities for Each Project Phase



### 8.3 Grievance Mechanism

The grievance mechanism is a process that enables stakeholders to make a complaint or a suggestion regarding the way a project is being implemented. This includes ensuring that all grievances that are received are acknowledged and logged and that the complainant knows what to expect in terms of response and when. Grievances may take the form of specific complaints for damages/injury, concerns about routine project activities, perceived incidents or impacts or requests for more information / clarity on project activities.

The primary objectives of a grievance mechanism are to:

- enhance trust and positive relationships with stakeholders;
- prevent the negative consequences of failure to adequately address grievances; and
- proactively identify and manage stakeholder concerns and thus support effective risk management.

This grievance procedure will be implemented by NHID and only covers the pre-construction and construction phase. Following the Project commissioning, RNT will be responsible for implementing a grievance mechanism during the operational phase.

The grievance procedure described in the ESIA is proposed to ensure an effective and timely response to community complaints and maintain good community and stakeholder relations. The five phases that constitute the grievance procedure are:

- Phase 1: Grievance receipt and registration
- Phase 2: Screening and Prioritisation
- Phase 3: Grievance Investigation
- Phase 4: Resolution and Feedback to Complainant (s)
- Phase 5: Grievance Close-out and Register Update

An indicative Project feedback mechanism is illustrated in *Figure 7*.

### 8.4 Monitoring and Reporting

It will be important to monitor and report on the on-going stakeholder engagement activities to ensure that the desired outcomes are being achieved, and to maintain a comprehensive record of engagement activities and the issues raised.

The following stakeholder community dialogue records and documentation will be used and maintained by NHID during pre-construction and construction phase: stakeholder list, stakeholder engagement log, commitments register, meeting minute template, grievance log and media monitoring of press and radio stories relevant to the project and unconventional related issues and activities.

The following internal reports will be developed by NHID E&S Manager:

- *Red Flag Reports*: consisting of weekly or daily reports for urgent items (e.g. high potential grievances) or incidents of significant nature.
- *Internal quarterly progress reports*: summary of engagement activities undertaken in the reporting period, grievance mechanism, risk to social license risk, limitations and priorities for the following quarter.

These reports will be discussed at quarterly meetings and will be circulated internally as required.

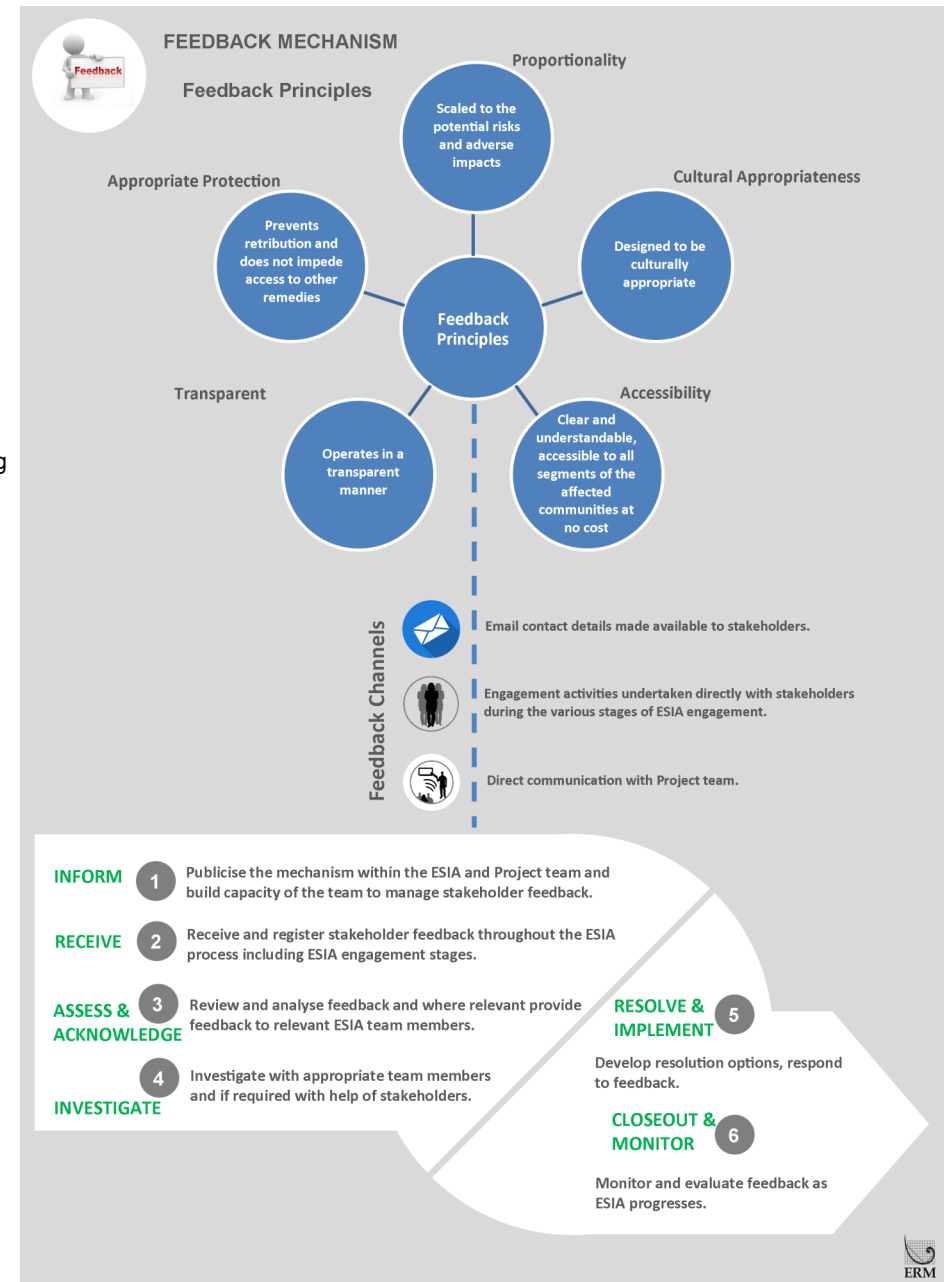


Figure 7. Feedback Mechanism



## 9.0 SUMMARY OF POTENTIAL IMPACTS

### 9.1 Introduction

Following the methodology described in *Section 5* of this NTS, the significance of potential impacts were assessed. The tables below summarize the resulting significance ratings of impacts both before mitigation and after mitigation.

Environmental / Social Variable	Project Activities/Impacts	Phase	Predicted Significance		Environmental / Social Variable	Project Activities/Impacts	Phase	Predicted Significance	
			Before Mitigation	With Mitigation				Before Mitigation	With Mitigation
Soils	Loss of soil resources due to erosion	Construction	Minor	Negligible to Minor	Community Health and Safety	Community Safety (Road Accidents, Site Trespass, Demining)	Construction	Moderate	Minor
Water Resources	Availability and Quality of Water Resources	Construction	Minor	Negligible to Minor		Environmental Health (Noise and Air)	Construction	Moderate	Minor
Air Quality	Road Traffic Exhaust Emissions	Construction	Negligible	Negligible		Interaction with Project Workforce	Construction	Moderate	Minor
	Dust and PM <sub>10</sub> from unpaved roads during construction activities	Construction	Major	Negligible		Perceived EMF health effects	Operation	Minor	Minor
Noise and Vibration	Noise from construction activities affecting nearby dwellings	Construction	Negligible - Minor	Negligible	Worker's Health and Safety and Workers' Rights	Effects on worker health and safety and labour rights	Construction	Moderate	Minor
Flora and Vegetation	Disturbance to vegetation and habitat loss and fragmentation as a result of the ROW	Construction	Moderate	Minor		Effects on worker health and safety and labour rights	Operation	Moderate	Minor
		Disturbance to vegetation and potential grow of invasive species as result of the maintenance works	Operation	Moderate	Negligible	Access to Infrastructure and Services	Disruption to traffic and transportation	Construction	Moderate
Fauna	Disturbance to avifauna species and degradation to environment during construction	Construction	Minor	Negligible	Improvement of the local road networks		Operation	Moderate	Positive
		Increase in bird mortality due to bird strikes during operation	Operation	Minor	Minor	Cultural Heritage	Damage of grave sites considered important by the local communities	Construction	Negligible
Visual Amenity	Deterioration of visual amenity	Construction	Minor	Negligible	Unplanned Events - Unplanned Spillages		Reduction in local soil quality	Construction and operation	Moderate
	Deterioration of visual amenity	Operation	Minor	Minor		Reduction in surface water	Construction and operation	Moderate	Minor
Economy And Employment	Local employment opportunities, capacity building and economic development	Construction	Moderate	Positive	Unplanned Events - Community Health and Safety	Risk during stringing activities	Construction	Moderate	Minor
	Long term local employment opportunities	Operation	Moderate	Positive		Effects from unplanned spillages	Construction and Operation	Moderate	Minor
Land and Livelihoods	Temporary loss of livelihoods and household income as a result of temporary land take and loss of access to land	Construction	Moderate	Minor		Effects from fire and/or explosion due to dielectric oil release	Operation	Moderate	Minor
	Physical displacement of Project-Affected People during construction	Construction	Major	Minor		Exposure to UXOs	Construction	Major	Positive
	Temporary loss of access to forest products from site clearing during construction	Construction	Minor	Negligible	Effects from transmission line snapping and transmission tower/pylon collapse	Operation	Major	Minor	
	Permanent loss of livelihoods and household income due to permanent land take and restrictions.	Operation	Moderate	Minor					
	Changes in land and property value	Operation	Minor	Negligible					

## 10.0 ENVIRONMENTAL AND SOCIAL MANAGEMENT

### 10.1 Introduction

One of the key outputs of the ESIA is an **Environmental and Social Management Plan (ESMP)** for the Project. The purpose of the ESMP is to ensure that recommendations arising from the ESIA are translated into practical management actions which can be adequately resourced, monitored and reported against through the phases of the Project.

The ESMP is intended to cover the Project activities during construction and operation described in *Section 2* of the ESIA report, and will be reviewed prior to the commencement of activities to ensure completeness. The main objectives of the ESMP are as follows:

- Ensuring compliance with regulatory authority stipulations and guidelines, which include local, national and international standards;
- Ensuring that there is sufficient allocation of resources on the Project budget so that the scale of the ESMP related activities is consistent with the significance of Project impacts;
- Verifying environmental and social performance through information on impacts as they occur;
- Periodically updating the ESMP as the Project activities progress;
- Responding to unforeseen events; and
- Providing feedback for continual improvement in environmental performance.

The applicable legal and policy requirements for this ESMP include:

- Decree N. ° 59/07 (13/07/2007) – Environmental Licensing — Angola;
- IFC Performance Standard 1; and
- World Bank Group General EHS Guidelines (2007).

The structure of the ESMP is set out according to the *Plan, Do, Check and Act* process:

#### Plan

- Define policies and objectives for environmental and social performance;
- Identify environmental and social impacts and risks of the operations;
- Develop mitigations and operational controls to address impacts and risks; and
- Develop a management plan to achieve these objectives.

#### Do

- Implement management plan; and
- Implement mitigations and operational controls.

#### Check

- Monitor performance against policies and objectives; and
- Check that mitigations and operational controls are effective.

#### Act

- Make corrections to plans, mitigations, or controls in response to performance monitoring or out of control events.

*The ESMP as a living document which will continue to develop during the construction phase to enable continuous improvement of the Project's social and environmental performance.*

### 10.2 Planning

Through the Project development and ESIA process, mitigation measures have been identified to address environmental and social impacts associated with Project activities. The Project has made a commitment to implement these to ensure or improve environmental and social performance.

### 10.3 Implementation

The effective implementation of the ESMP (in alignment with the Stakeholder Engagement Plan and the Resettlement and Compensation Action Plan implementation) is dependent on established and clear roles, responsibilities and reporting lines within and between GAMEK/RNT and NHID. This institutional framework has been established during the ESIA.

NHID will maintain a formal procedure for communications with the regulatory authorities and communities. The HSE Manager is responsible for communication of EHS issues to and from regulatory authorities. All communications made to regulatory agencies should also be reported to NHID's HSE Manager. The Project will implement a grievance mechanism whereby community members can raise any issues of concern. All grievances and enquiries are to be logged and evaluated.

In addressing the different needs of stakeholders, the Project's SEP will be modified and updated as required. Implementation will rest with the HSE Manager and the Community Liaison Team Manager.

### 10.4 Checking and Corrective Action

Checking includes inspections, monitoring and audit activities and is used to measure the effectiveness of mitigations. EHS inspections will be conducted weekly and formally once every six months. Monitoring will be conducted to ensure compliance with regulatory requirements (parameters are included in the ESMP). Audits will be carried out by NHID and will cover the contractor self-reported monitoring and inspection activities.

NHID will implement a formal non-compliance and corrective action tracking procedure for accidents or E&S non-compliances. In terms of reporting, NHID will keep the regulatory authorities informed of the Project performance through reports and meetings.

### 10.5 Additional Documents

The ESMP has identified some additional plans (and policy) that will be prepared by NHID HSE Manager prior to construction commencing on all transmission lines:

- |   |   |
|---|---|
| • Traffic & Transportation Management Plan; | • Employment and Workforce Management Plan;                 |
| • Spill Contingency Plan;                   | • Community Health and Safety and Security Plan;            |
| • Construction Management Plan;             | • Occupational Health and Safety Plan;                      |
| • Waste Management Plan;                    | • Community Health, Safety and Security Plan;               |
| • Chemicals Management Plan;                | • Resettlement and Livelihood Restoration Plans (LRPs); and |
| • Emergency Preparedness and Response Plan; | • Local Content and Procurement Plan.                       |
| • Chance Find Procedure;                    |   |
| • Stakeholder Engagement Plan (SEP);        |   |

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