



Environmental and Social Review Summary

Cambambe Hydroelectric Dam, Angola

This Environmental and Social Review Summary (ESRS) is prepared by MIGA staff and disclosed prior to the date on which MIGA's Board of Directors considers the proposed issuance of a Contract of Guarantee. Its purpose is to enhance the transparency of MIGA's activities. This document should not be construed as presuming the outcome of the decision by MIGA's Board of Directors. Board dates are estimates only.

Any documentation that is attached to this ESRS has been prepared by the project sponsor, and authorization has been given for public release. MIGA has reviewed the attached documentation as provided by the applicant, and considers it of adequate quality to be released to the public, but does not endorse the content.

Country: Angola

Sector: Energy

Project Enterprise: Cambambe Dam

Environmental Category: A

Date ESRS Disclosed: 19 March 2013

Status: Due Diligence

A. Project Description

HSBC Bank plc (“HSBC”) has requested MIGA to provide coverage for financing of Phase II of a three phased rehabilitation and expansion project of the Cambambe Hydroelectric power station 180 km east of Luanda, Angola. Phase I, which was completed in December 2012, involved the rehabilitation of the four existing turbine generators, which were not operational. Phase II, which the MIGA guarantee will cover, involves the construction of a second powerhouse with four additional turbine generators, initially rated at 120MW each or 480MW in total and construction of a concrete spillway on the basis of an EPC contract awarded to Odebrecht SA of Brazil. Phase III, which is also underway, involves the heightening of the dam wall from 102m to 130m in elevation, which will result in a final capacity of 700 MW, a further increase of 220 MW from the original power plant.

Odebrecht has selected Voith Hydro GmbH & Co. KG (“Voith”) of Germany and Elecnor SA (“Elecnor”) of Spain as sub-contractors for the provision of mechanical and electrical equipment and services respectively. The total value of the EPC contract to be financed with MIGA's support is EUR560m and the Ministry of Finance (“MoF”) of Angola mandated three banks, HSBC, Société Générale S.A. (“SG”) and BHF-BANK Aktiengesellschaft (“BHF”), to structure a financing package for the project costs (with HSBC acting as Coordinating Arranger).

The Cambambe plant, operated by Empresa Nacional de Electricidade (“ENE”), is one of two hydroelectric power stations currently in operation on the Kwanza River (520MW Capanda plant is further up-river). The river is the longest river in Angola (960km) and has the most significant power generation potential in the country, estimated at 7,000MW. Of this, only 700MW is currently utilized. The Cambambe plant is located within 500 metres of Cambambe Village (1,210 inhabitants). There are two other villages within 10 km of the project site, including Terra

Nova (95 inhabitants and 5 Km away) and Cambingo (207 inhabitants and 10 Km away). The town of Dondo is situated 11 km downstream of the dam with a population of approximately 30,000.

MIGA's environmental and social review includes both Phase II and Phase III – the construction of the new powerhouse, the installation of four turbines and the heightening of the dam wall resulting in the inundation of 4.2km² of land. As a result of the inundation, a 4 km stretch of road and a bridge will be relocated, requiring a separate environmental and social assessment. Transmission lines will also be installed and will require further assessment. Prior to relocation and installation, environmental and social assessments will be submitted to MIGA for review. Phase II and Phase III are expected to be completed in approximately 3 years.

B. Environmental and Social Categorization

This project is Category A according to MIGA's policy on social and environmental sustainability, as it has potentially significant adverse social or environmental impacts that are diverse, irreversible, or unprecedented. The rehabilitation and expansion of the existing infrastructure, the increase in the height of the dam wall and associated infrastructure, could potentially result in diverse negative environmental and social impacts related to: landscape, underground water quality, surface water quality, air quality, noise levels, waste water, solid waste, hazardous waste, biodiversity, worker health and safety and communities health and safety during construction and operation. Cumulative impacts on the Kwanza River will be considered.

C. Applicable Standards

While all Performance Standards are applicable to this investment, our current information indicates that the investment will have impacts which must be managed in a manner consistent with the following Performance Standards:

- PS1: Social and Environmental Assessment and Management Systems
- PS2: Labor and Working Conditions
- PS3: Pollution Prevention and Abatement
- PS4: Community Health, Safety & Security
- PS5: Land Acquisition and Involuntary Resettlement
- PS6: Biodiversity Conservation & Sustainable Natural Resource Management
- PS8: Cultural Heritage

The findings of MIGA's due diligence confirmed that there are no Indigenous Peoples (PS7) impacted by the project.

D. Key Documents and Scope of MIGA Review

MIGA's social and environmental development specialist conducted a site visit and met with the guarantee holders; Voith; Elecnor; Holisticos, the environmental consultant of the Environmental Impact Statement ("EIS"); SRK Consulting South Africa ("SRK"), the environmental consultant commissioned by HSBC to carry out the additional environmental and social due diligence; the Angolan Ministry of Environment; World Bank Group in Angola and World Bank Group Senior Hydro Specialist in Washington. HSBC and SG are Equator Banks and commit to applying the Equator Principles to their investments. The following documents were reviewed by MIGA:

- Environmental Impact Study for the rehabilitation and Expansion of the Cambambe Hydroelectric Power Plant, Holisticos, for ENE updated in December 2012;
- Cambambe Dam Project Phase 2 Environmental and Social Due Diligence, SRK, March 2013 for HSBC, incorporating the Corrective Environmental and Social Action Plan;
- Environmental License for construction, Ministry of Environment, Angola 30th May, 2011;
- Clean Development Mechanism Project Design Document Form (CDM-PDD), 29th June, 2011;
- Chaleno Kiambote, Social Responsibility Program Power Point Presentation, Odebrecht, February, 2013;
- Relatório de Elaboração de Estimativa de Emissões de Gases de Efeito Estufa da Albufeira de Cambambe – Odebrecht, Green Doumus, 19th September, 2012; Environmental Management Power Point Presentation, Odebrecht, February, 2013;
- Heightening of Cambambe Arch Dam, Angola, Updated Final Design, Static and Dynamic Analyses, Stucky, March, 2011.

E. Key Issues and Mitigation

PS1: Social and Environmental Assessment and Management Systems

MIGA's assessment considered the Odebrecht consortium's (Odebrecht, Voith and Elecnor) and ENE's management of its environmental, health and safety performance in the establishment and operation of the facilities; compliance with national and local permitting requirements; and engagement with local communities regarding environmental, health and safety performance.

Social and Environmental Assessment:

An initial EIS was completed by an Angolan environmental consulting company (Holisticos). The EIS, first drafted in 2010 and updated in December 2012, was developed to meet the environmental standards of the Angolan Ministry of Environment. An independent environmental and social consultant was appointed by HSBC to undertake the pre-financial close Environmental and Social Due Diligence (ESDD) according to the Performance Standards; the World Bank Group Safeguards Policy on safety of dams (OP 4.37, 2001); Core Values and Strategic Priorities of the World Commission on Dams; and the Equator Principles. During the initial EIS process, a

comprehensive baseline study was undertaken and impacts related to physical and chemical; ecological/biological; social/cultural and economic/legal, impacts were assessed.

The lender's assessment resulted in a number of areas of concern as follows:

- Cumulative impacts were not considered and will require a separate study.
- The series of rapids on the Kwanza River located upstream from the Cambambe dam could be regarded as a unique ecosystem under threat from the cumulative impacts of the existing Cambambe and Capanda dams, and further dams planned to be constructed on the River; however further assessment is needed in order to determine how the rapids will be impacted by the dams and to identify mitigation measures as necessary.
- Potential impacts of the relocation of a road and bridge, which falls within the project footprint and which will be inundated, were not included and will require a separate assessment, which is currently being carried out.
- Potential impacts of power transmission lines were not included and will require a separate assessment.
- Risk of dam failure in relation to seismic events have been assessed, but requires an action plan to be included in Odebrecht's Emergency Response Procedures (ERP).
- Community consultation was carried out, but quite minimally and therefore a detailed stakeholder engagement plan will be developed.
- Surplus material (waste rock) is not being placed in locations identified in the EIS and of particular concern is surplus material which is being placed on the right bank of, and in the Kwanza River, downstream of the proposed powerhouse and for the construction of a new road required to transport heavy machinery, such as turbines, to the site.

These recommendations and actions will be included in the revised Environmental Management Plan ("EMP") for construction and operation which Odebrecht and ENE will have the responsibility of implementing. A corrective action plan has been developed by the lender's consultant who will regularly monitor progress against actions.

Management Program and Monitoring:

An EMP for construction was included in the impact assessment, but will be further developed to ensure it captures the additional impacts identified by the lender's consultant. Odebrecht will be responsible for implementing the EMP for the construction phases. The EMP for operations will be developed by Odebrecht prior to project's commissioning and ENE will be responsible for its implementation. Odebrecht, Voith and Elecnor are guided by their own corporate social responsibility policies which will be implemented at the project level and are ISO 14001 and 9001 and OHSAS 18001 certified. Sub-contractors will follow the construction EMP and will be obliged to comply with MIGA's Performance Standards (PS), overseen by Odebrecht.

Odebrecht's EMP for construction comprises five sub-programs as the vehicles for implementation, namely: social communication; education and environmental awareness; social support; construction support and bio-physical monitoring. A number of policies, plans and procedures are in place and will be regularly reviewed by management to demonstrate continuous improvement. A commitments register will also be developed which will ensure all mitigation measures identified in the EIS, as well as conditions of the Environmental License, World Bank Group Environmental Health and Safety (EHS) Guidelines and Performance Standards are integrated into Odebrecht and ENE policies, plans and procedures. An environmental and social management team has been appointed, which consists of approximately 60 staff, including senior

management, technical staff and community development workers. Key social and environmental responsibilities are well defined within the organization. Sufficient financial resources are available for adequate implementation of Health Safety Environment (“HSE”) policies, plans and procedures during operations. The EMPs will be revised based on regular inspections and the development of corrective action plans as necessary.

Mechanisms for internal review of compliance with HSE policies and procedures include weekly feedback to management and completion of a monthly checklist. In addition, internal inspections of facilities are conducted by HSE staff on a weekly basis. For the construction phases, Odebrecht has developed a legal compliance register to be used as the basis of regular legal compliance and will ensure annual external audits are completed. The Ministry of Environment will monitor the project regularly to ensure it is in compliant with the conditions stipulated on the environmental license.

Odebrecht will manage the construction phase of the project and ENE will manage the operations of the power station. While ENE has an operations manual with procedures including health and safety instructions, ENE does not have an integrated management system. Odebrecht will conduct a skills needs assessment of ENE’s HSE team. Odebrecht has committed to carry out capacity building activities to ensure ENE has the appropriate systems and staff in place to manage the project during operations. The lenders will have the responsibility for reviewing progress of ENE’s management performance for the first few years of operations measured against ENE’s compliance with the EMP. Implementation and compliance of the EMP are contractual obligations.

Organizational Capacity and Training:

A training plan has been developed for all Odebrecht, ENE, Voith and Elecnor staff with regards to occupational and environmental health and safety. The training plan includes an assessment of training needs, delivery of training to cover topics such as safety at work, safety in electrical services, emergency procedures, ergonomics, solid waste management, etc., followed by an evaluation of the effectiveness of training. Members of Odebrecht’s environmental and social management team are on site daily to monitor safety.

PS2: Labor and Working Conditions

Odebrecht has an integrated HSE policy and a project-specific Occupational Health and Safety (OHS) Plan/System in line with PS2, which apply during the construction and commissioning phases of the project. Areas of high risk and hazards are known and general protective and preventive measures implemented. A strong safety culture is evident, with particular emphasis on working at heights, which is one of the key occupational safety risks. Workers are required to use Personal Protective Equipment (PPE) and working areas are evacuated during blasting. Daily Safety Dialogue (DSD) talks are carried out to reinforce safety culture, as are the information boards. Safety signage is apparent throughout the site and speed bumps are in place.

A formalized recruitment plan is in place for the 2700 workers currently employed for the construction phase with the vast majority of them hired locally. Odebrecht does not make use of forced or child labour, not employing anyone under the age of 18. Approximately 50 new jobs will be created during the operations phase, bringing the total to 130 operations staff once the second power house becomes operational. Recruitment for both construction and operations

phases is done on the basis of qualifications and skill with the same conditions applied to local and migrant workers. The recruitment policy commits Odebrecht to the principles of equal opportunity and fair treatment in compliance with Angolan law. Both Odebrecht and ENE staff are paid above minimum wages. A service order defining workers' rights and working conditions is included in each individual's employment contract with Odebrecht.

ENE acknowledges its lack of capacity and required technical skills for environmental and social (E&S) management, and has an agreement with a university to provide scholarships for students who would then work for ENE. As mentioned above, Odebrecht will carry out an assessment of ENE's capacity to manage HSE and develop a capacity building program to address deficiencies, as well as revising ENE's OHS procedures to comply with international best practices and in line with PS2.

ENE has a recruitment plan in place which favours local workers with suitable skills, and excludes the use of child labour, in compliance with Angolan legislation. The company has a collective agreement with unions that set out working conditions in line with Angolan law. Voith and Elecnor have their own OHS procedures which Odebrecht will review to ensure they are in line with PS 2. Odebrecht will also review their primary suppliers to ensure they are also compliant.

For the construction phases, three types of accommodation are available for staff who do not live locally, including workers from Odebrecht, Voith and Elecnor. The type of accommodation is based on the staff position within the company and maintained in accordance with OHS and EHS policies. Staff who live on site are provided three meals per day and those who live locally are provided two meals per day. ENE staff are housed in designated accommodation in the Cambambe village. At the end of employment, Odebrecht will offer all employees positions on other contracts in Angola. Odebrecht have a communication procedure in place which includes a grievance mechanism for workers and sub-contractors. This will be improved to comply with PS2.

Malaria is prevalent in the area, but daily spraying occurs in accommodation, work sites and offices. To date the incidence rates are fairly low. On-site health care facilities are considered adequate, and provision is made for medical evacuation where necessary. Odebrecht has an Emergency Response Plan (ERP), and accidents, incidents, near misses and diseases are documented and reported.

PS3: Pollution Prevention and Abatement

The project involves civil works related to the construction of a second open power house, a concrete lateral spillway, an internal road and the heightening of the dam wall. Key pollution risks related to construction include sewage, unmanaged domestic and industrial waste disposal, hydrocarbon spills from storage facilities and workshops, inappropriate storage of chemicals and hazardous substances, dust/particulates from blasting, quarrying, earthworks and sedimentation. Comprehensive monitoring of ambient conditions of air and water quality occurred during the EIS and continues. Odebrecht has an Integrated Environmental Management Plan which includes monitoring requirements and EHS procedures and policies. All of these plans will be updated to ensure compliance with World Bank Group (WBG) Environmental Health and Safety ("EHS") guidelines and World Health Organisation (WHO) guidelines. Resource use efficiency aspects will also be incorporated into management plans where possible.

Liquid waste management

A wastewater treatment plant is under construction and systems and procedures are in place to treat domestic and industrial effluent (which is discharged to the Kwanza River upstream of the dam). Water quality in the Kwanza River is monitored at a number of points upstream and downstream of the dam and also upstream of the effluent discharge point. Samples are tested both on site as well as at the Eka beer laboratory close by. Water quality monitoring is undertaken by Holisticos and will be carried out monthly for the first three months and thereafter every three months to ensure compliance to WBG EHS Guidelines and local standards

Solid Waste management

Waste management principles to guide a proposed residue management strategy are presented in the EIS, with reference to normal residues, hazardous residues, vegetation residues and metal residues (scrap). A detailed waste management plan will be developed by Odebrecht which will include investigation of options for disposal and recycling. The plan will include the following measures:

- Waste separation and recycling area
- Landfill
- Composting facility
- Short-terms waste storage area
- Incinerator for Class 1 waste
- Area for storage of scrap metal
- Chipping of waste wood for use during rehabilitation

A landfill is currently being established in a former borrow pit. Odebrecht confirms that the design of the landfill has been undertaken in line with local and international waste facility design standards. The landfill will be used for the disposal of non-hazardous solid waste. Recyclable wastes are separated and Odebrecht has identified certified recycling companies who will dispose of this material. They will collect the waste from site and take it to Luanda for processing.

Hazardous waste management

Hazardous wastes such as used oil, lubricants, fuel, batteries, light bulbs, etc., are generated at mechanical workshops, fuel stations, lubricant stores, concrete mixing site, etc. Based on recent works, approximately 100,000 litres of used oil are produced annually along with approximately 1,000 used filters. Odebrecht has identified certified third parties, EAS and Ambiente, who dispose/recycle/process hazardous waste in Luanda as appropriate. They come directly to the site and transport the waste to their disposal facilities in Luanda. In the future, Odebrecht will be installing an onsite hazardous waste facility approved by the Ministry of Environment. Generators are housed appropriately and fuel, oils, solvents, additives and lubricants are suitably stored in lined and banded facilities to prevent soil and water contamination. Pesticides used for deterring mosquitoes and tsetse fly are handled, stored, applied and disposed of in accordance with Good International Industry Practice (GIIP) and no banned substances are used. Cement waste and tar are disposed of in an authorized area on site which will be licensed by the Ministry of Environment.

Air and noise pollution

Air pollution is not considered a major concern on site, although dust suppression measures such as water sprinkling are implemented and air quality is monitored on site (particularly in the access

tunnel). Temperature is monitored on site for occupational safety purposes. Noise is monitored by Odebrecht during the day and at night for 30 minutes both on site and within Cambambe Village which is the closest village to the site and noise levels during operations are within the EHS guidelines. Explosions take place once every 2 days at specified times (07:30, 14:00 and 17:30). The villagers of Cambambe are evacuated to the Cambambe club house during controlled explosions which usually last approximately 30 minutes. The need for explosions will cease in August 2013.

A greenhouse gas (“GHG”) emissions study has been completed. Additionally, a Clean Development Mechanism (“CDM”) Project Design Document was completed which estimates that 22,974 tons of CO₂ would be reduced from the baseline scenario over 7 years of crediting period as a result of the expansion of the installed capacity of the project which would qualify for carbon credits. GHGs will be emitted during construction; however, these will be offset during operations as well as during rehabilitation and re-vegetation of degraded areas. An action plan, following recommendations in the CDM report will be developed to ensure GHG emissions are reduced. ENE will follow up with UNFCCC on the process.

Quarrying residues

At the moment waste rock from quarrying activities related to above and below ground excavations is being placed on the bank of and in the Kwanza River in order to create a road which will be used for the transportation of large items such as turbines and generators. The impacts of this activity were not considered in the EIS and therefore an assessment will be carried out and submitted to the Ministry of Environment for its consideration and to inform Odebrecht of its obligation to mitigate any negative impacts. Approximately 833,081m³ of rock is being excavated in total and could potentially lead to sedimentation and pollution, etc.

Erosion

In order to minimize erosion in the river from excavation works, temporary drainage systems will be constructed in areas of work to divert any run off away from the river. Excess soil and rock stock piles will be appropriately stored and covered to avoid erosion and wind blow. An adequate drainage system is installed along roads to control run off during the wet season. These measures are included in the construction phase EMP.

Based on the review of the environmental management system Odebrecht is expected to manage the project’s environmental impacts in line with the Performance Standards and EHS guidelines.

PS4: Community Health, Safety & Security

The Cambambe plant is located within 500 metres of Cambambe Village (1,210 inhabitants). There are two other villages within 10 km of the site, including Terra Nova (95 inhabitants and 5 Km away) and Cambingo (207 inhabitants and 10 Km away). The larger town of Dondo, (30,000 inhabitants) is located 11 km downstream of the site.

The project site is fenced and has one main entrance which is controlled by police, the army and private security – 350 army personnel (armed), 200 National Police personnel (armed), and 57 private security personnel (unarmed). Odebrecht security (unarmed) protects equipment and facilities procured by Odebrecht. There are contractual arrangements between ENE and Odebrecht regarding security. Security arrangements are guided by principles of proportionality

and Good International Industry Practice (GIIP). A community grievance mechanism will be developed and implemented for all external stakeholders and a procedure will be in place to investigate incidences of unlawful or abusive acts of security personnel.

The transport, storage and use of explosives are guided by an explosives management handbook managed by trained experts. Adequate safety and security is provided during the transport of explosives to the site and within the site, such as police escorts and unmarked vehicles. An explosives store allows for separate storage of explosives and detonators. All explosions are carefully controlled and managed by a team of experts. Explosions take place once every 2 days at specified times, as mentioned above, when the villagers of Cambambe are evacuated as mentioned above.

Measures are taken to control malaria and tsetse flies on site and in surrounding villages through indoor residual spraying. The EIS notes the risk of an increased incidence in sexually transmitted diseases, such as HIV/AIDS. An education and environmental awareness program will target workers and the local population with a focus on health and hygiene. Health and safety risks will be addressed within the stakeholder engagement plan as well as other existing programs such as Chaleno Kiambote, the community development program.

According to the EIS, dam failure is considered a limited risk. However, Odebrecht commissioned a review to carry out an evaluation of the dam design and safety and it was concluded that the current dam is structurally sound and that the proposed heightening of the wall would not pose an increased stress on the original structure. The addition of gates in the dam wall and at the spill way will be an additional safety feature in the event of a flood. This review was verified by ENE's third party consultant. A dam failure emergency response plan has not yet been developed by Odebrecht; however, the Angolan Government is expected to develop a national Emergency Response Plan (ERP) which will include dam failure measures. The timeline for this is unclear. In the meantime, Odebrecht's ERP will be revised to include emergency response procedures in the case of dam failure. The current ERP provides procedures for life, fire, safety events but it does not make provision for the involvement of local government agencies and the communities in case of an emergency. The ERP will therefore be revised in consultation with authorities and communities to ensure that there are sufficient resources to deal with dam failure and other catastrophic events.

According to baseline water quality tests, the river Kwanza was found to be contaminated with bacteria and high levels of cadmium and mercury. However, following regular monitoring over a period of three years it was concluded that this is not as a result of the activities of the project. The river is used by local communities for fishing, transport, recreation, bathing and for some household water supply therefore it is suspected that bacteria is as a result of human activity such as bathing, clothes washing, etc., upstream of the dam. It has not been possible to determine the main sources of cadmium and mercury; however, regular testing will be carried out by Odebrecht to ensure that project related activities are not contributing to poor water quality.

PS5: Land Acquisition & Involuntary Resettlement

An area of 4.2 km² allocated by the government will be inundated by the project as a result of the heightening of the dam wall. Based on surveys undertaken by Odebrecht and Holisticos, no known physical or economic displacement will occur. However, two families are demanding compensation. Further investigations will be undertaken and, if it is subsequently found that the

claims are valid, compensation will be provided in line with PS5. Since there are a number of small subsistence fields in close proximity to the inundated area, it is possible that additional fields may be established in the area prior to inundation. To preclude later claims, several actions will be undertaken: a) the boundaries of the inundated area will be marked and communicated, b) the absence of economic activity in this area will be confirmed, and c) a policy which will not compensate new activities in this area will be clearly communicated to all local communities and stakeholders in conjunction with the local government.

A police station located close to the bridge and an army de-mining camp will be relocated due to the planned inundation. As these are government facilities, the government has agreed to take the responsibility for moving these facilities to a suitable location. A limited number of provisioning ecosystems services have been identified including charcoal production, recreation and boat transport. An assessment will be conducted prior to inundation to determine the impacts and mitigation measures on community's livelihoods. Odebrecht will work with ENE on addressing the mitigation measures which could include identifying alternative areas to enable these activities to continue.

PS6: Biodiversity Conservation & Sustainable Natural Resource Management

An extensive biodiversity assessment was carried out as part of the EIS, although the threat of land mines limited the extent to which this assessment could be carried out. The biodiversity assessment covered impacts to flora and fauna, both at the current project site; at the site which will be inundated and in the river. The assessment took place over the course of 2 years in order to capture all seasons. It also included a review of secondary data collected from The Catholic University of Angola, The University of Agostinho Neto and The River Kwanza Management Office (GAMEK). A model simulating flow scenarios for Cambambe both during the dry and wet seasons supported that habitats will not be significantly affected by this project. The area to be inundated is not located in a legally protected or internationally recognized area and includes a combination of modified, natural and pristine habitats comprising dry deciduous forest and dry savannah.

The assessment identified a number of species of tree which appear on the Angolan threatened list: *Acacia sieberiana*, *Diospyrus mepoloformis*, *Piliostigma thoningil* and one on the IUCN red list *Pterocarpus angolensis* (lower risk/near threatened), although they are known to also occur outside the project site. Thirty one species of fish were identified. The Cyprinidae and Cichlidae families display the greatest diversity and abundance and no protected species were observed. Eighty nine avian species were identified in the area corresponding to 9.7% of the known species in Angola. Two species are on the IUCN's Red List – the peregrine falcon (*Falco peregrinus*) and the golden-backed bishop (*Euplectes aureus*), both classified as least concern. The following mammalian species were identified within the study area: serval (*Felis serval*), bush duiker (*Sylvicapra grimmia*), bushbuck (*Tragelaphus scriptus*), hare (*Lepus crashawi*) and rock hyrax (*Procavia capensis*). No rare or threatened mammal species were observed.

There are a series of rapids on the Kwanza River located between the Capanda dam and the Cambambe dam which could be regarded as a unique ecosystem under threat from the dams on the river; however further assessment will be carried out in order to determine how the rapids will be impacted by the dams and to identify mitigation measures as necessary.

River flow is regulated by the existing Capanda dam upstream from Cambambe, which guarantees a minimum flow of 500 m³/s. A simulation model was conducted based on the information available in terms of water flow, main water extraction activities for irrigation and human consumption and water flow from the Capanda Dam. This was done to calculate the ecological water flow that needs to be maintained in order to minimize any downstream effects both on human activities and the environment. The model indicated that the proposed activities for Cambambe will enable the minimum 500 m³/s water flow to be maintained. The EIS concludes that this is considered sufficient to ensure there is no impact on fish species and other biodiversity in the river.

In order to allow construction works to take place on the middle section of the dam and spillway, the river will be diverted. These works will be undertaken during the dry season when river flow is at a minimum. The river flow will not be affected as the water will be diverted through the intake cleaner tunnel which is located close to the dam and discharged just after the dam via the outlets at the bottom of the dam. Odebrecht will ensure that water flow is regulated so there are no negative impacts on fish species in the Kwanza River.

A biodiversity management plan will be developed to ensure adequate water flow to decrease impacts and maintain biodiversity and ecosystem services. Implementation of the plan will be carefully monitored by Odebrecht and ENE and activities adjusted as necessary.

PS8: Cultural Heritage

The project area is primarily uninhabited and consists of low altitude dry savannah and dry deciduous forest. To date there have been no significant archaeological areas identified for this region. However a heritage assessment including consultation with the local communities and relevant regulatory agency will be carried out. Mitigation measures, if needed will be developed following the assessment. A Chance Find Procedure will be applied in the event that items of archeological significance are unearthed in the course of construction and excavation activities.

F. Environmental Permitting Process and Community Engagement

An Environmental License, based on the EIS of 2010, was awarded by the Ministry of Environment to ENE on 26 April, 2011 and stipulates a number of conditions such as ensuring hazardous materials are stored appropriately, noise is controlled after dark, biodiversity is maintained, etc. These conditions will be monitored by the Ministry on a regular basis. The license is solely for the construction phase and a second application will be required in order to obtain a license to operate the power plant. Several additional activities will require further assessment given their potential impacts to the environment, such as placing of surplus rock in the river and relocation of the surplus material dump. Following their assessment, the Ministry of Environment will be notified and if necessary the environmental permit will be adjusted accordingly. All other permits and licenses required during construction have been obtained.

Community engagement during the EIS process was limited to a public hearing which was convened prior to submission of the final EIS. Following the review of the community consultation by SRK, it was concluded that the consultation was not sufficiently comprehensive and therefore revisions to the community engagement plan are required to ensure a complete process of public consultation is followed. This will be completed in the next 6 months.

Odebrecht has already begun consultation with the people of Cambambe, Terra Nova and Cambingo villages, the villages closest to the site and directly impacted by the project, through the community development program called “Chaleno Kiambote” However, engagement with the wider community and the region is limited. A more comprehensive community engagement plan will be developed to include villages further afield. A grievance mechanism for the communities will also be developed. The “Chaleno Kiambote program works with the communities located near to the project site on health, education and income generation activities. In Cambambe village, the school, church and community centre have been rehabilitated by Odebrecht. In other villages, assistance has been provided for agricultural activities and a new school will be built. Other training courses are offered on English and computers for the local community. Sports activities are organized as well as social action to clean up villages. Through this program training is offered to employees of ENE on subjects such as operation and maintenance of the power station. In addition Odebrecht developed the “Acreditar” social responsibility program focused on training and qualification in specific construction skills.

G. Availability of Documentation

- [Environmental Impact Study for the rehabilitation and Expansion of the Cambambe Hydroelectric Power Plant, Holisticos, for ENE, updated in December 2012;](#)
- [Cambambe Dam Project Phase 2 Environmental and Social Due Diligence, SRK, March 2013 for HSBC, incorporating the Corrective Environmental and Social Action Plan.](#)

The above listed documentation is available electronically as PDF attachments to this ESRS at www.miga.org. The EIS is also available on the web site of Euler Hermes Deutschland AG (<http://www.agaportal.de/en/aga/projektinformationen/a-projekte.html>), the official Export Credit Agency of the Government of Germany, who is also providing support for the financing of the project, and the website of Odebrecht in Angola (www.odebrecht.co.ao).