Multilateral Investment Guarantee Agency
World Bank Group

Environmental and Social Review Summary

Eolo Wind Farm

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:	Nicaragua
Sector:	Energy
Project Enterprise:	Eolo de Nicaragua, S.A.
Environmental Category:	Category B
Date ESRS Disclosed:	22 June 2012
Status:	Due Diligence

A. Project Description

MIGA has been asked to provide Globeleq Mesoamérica Energy (Wind) Limited (GME) with guarantees totaling approximately USD 25 million for up to twenty years against the risks of transfer restriction, expropriation, and war and civil disturbance for the Eolo de Nicaragua (Eolo) Wind Farm project. This project comprises the construction of a 44 megawatt (MW) wind farm in Department of Rivas, Nicaragua, on the shores of Lake Nicaragua, 3 km away from two other existing wind farms (Amayo I/II which began operations in 2009). Eolo is estimated to generate approximately 169.6 Gigawatt hours (GWh) of electricity per year from a renewable energy source.

The project is being developed under Eolo de Nicaragua, S.A., a wholly owned subsidiary of GME Wind. The Project will be carried out through an engineering, procurement and construction (EPC) contract and a ten year operation and maintenance (O&M) contract with Gamesa Eolica (Gamesa). The construction period is expected to be 12 months with the main civil works being carried out primarily in the dry season (February to July); the wind farm is estimated to start operations by December 2012. The electricity will be fed into the national grid and purchased by two local electricity distribution companies.

The Eolo project consists of twenty-two Gamesa G90 2 MW wind turbine generators (WTGs) for a total installed capacity of 44 MW. The project will also include a 60 MVA transformer and corresponding substation and a 200 m 230 kV transmission line to connect to the regional high-voltage transmission line, which is part of the national grid. The WTGs will be installed on 78 m hub height tubular towers and have rotor diameters of 90 m. The selection of the project site was based on availability of wind resources, access to the site, minimal land use conversion, and

relatively close vicinity of the national electricity grid. The project is located on two neighbouring farms (San Carlos and El Limon) in an area that has been highly impacted throughout the years, either from cattle grazing and/or agriculture. Total land of the two farms is approximately 1,100 hectares (ha), out of which approximately 550 ha will be developed for the Eolo project. The terrain where these WTGs will be located is generally flat and parallel to the Pan-American Highway, thus requiring very short access roads to the project site. The substation, one 30 m high transmission tower, and 200 m transmission line will be located within the El Limon farm. The centralized supervisory control and data acquisition (SCADA) system will be designed to have the ability for the Nicaragua energy dispatch center (CNDC) to remotely monitor the plant operation. The life of the project is estimated to be more than twenty-five years and thus decommissioning plans are yet to be developed.

GME Wind is a member of a group of companies that an own, operate and develop wind energy in Central America, with wind farms operating in Honduras and Costa Rica. Gamesa, the main contractor, is a well recognized first tier WTG manufacturer, and provider of wind technology and services. It has more than 20 gigawatts installed in four continents of which 13.4 GW is under operations and maintenance contracts. Coperco is a Nicaraguan civil contractor with experience on two other wind farms located in Nicaragua and has been retained to carry out the civil works for the project as a subcontractor of Gamesa. TSK is a Spanish contractor providing the engineering, procurement and construction of the substation as a subcontractor of Gamesa.

B. Environmental and Social Categorization

The Eolo Investment Project has been categorized as a Category B project under MIGA's Policy on Social and Environmental Sustainability. Potential environmental and social impacts and risks associated with the construction phase of wind farms are mainly related to the erection of the wind turbines, and the installation of the transmission line, substation and access roads. Key construction impacts include habitat disturbance, soil erosion, dust generation, increased heavy traffic, noise, loss of vegetation, occupational health and safety hazards for the workforce (including working at heights, electrocution, etc.), and community health and safety due to increased traffic. Once in operation, the main potential impacts and risk associated with wind farms include bird and bat collision and mortality, loss of vegetation, accidental discharges of hazardous materials, community health and safety hazards, and noise impacts caused by the wind turbines. It is possible to readily design and implement engineering and management measures to mitigate adverse impacts during construction and operations.

C. Applicable Standards

While all Performance Standards are applicable to this investment, based on our current information, 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 & Involuntary Resettlement
- PS6: Biodiversity Conservation & Sustainable Natural Resource Management.

Performance Standard 7 (PS 7) is not applicable as there are no indigenous peoples residing in the project area. PS 8 is not applicable as there are no identified impacts on cultural heritage. Notwithstanding, the Project will implement a Chance Finds procedure to address unanticipated impacts on cultural heritage.

The World Bank Group (WBG) EHS guidelines applicable to this project are the General Guidelines, and sector-specific EHS guidelines for Wind Energy, Electric Power Transmission and Distribution, and Construction Materials Extraction.

Nederlandse Financierings-Maatschappij Voor Ontwikkelingslanden N.V. (FMO) and other lenders supporting the project have applied the Performance Standards as part of their commitment to the Equator Principles. As part of this commitment, an independent environmental and social consultant was retained to assist the lenders with due diligence and ongoing monitoring.

D. Key Documents and Scope of MIGA Review

As part of its due diligence, MIGA's environmental specialist visited the project site in June 2012. MIGA carried out interviews with GME Wind, Eolo, and Gamesa (including its key contractors Coperco and TSK) onsite key environmental, health and safety (EHS) staff, and conducted a site visit to the project location. In addition, MIGA's due diligence of this project also included review of project-related environmental and social information. Key environmental and social documents reviewed by MIGA included:

- *Proyecto Eolo de Nicaragua, 60 MW Programa de Gestión Ambiental [finca San Carlos]*, prepared by Mauricio Lacayo, November 2009
- *Estudio de Impacto Ambiental Eolonica Wind Power,* prepared by Fiallos & Asociados S.A. Consultores, March 2011
- *Eolo de Nicaragua S.A. – 60 MW Estudio de Impacto Ambiental de Linea de Transmissión de Alto Voltaje y Subestación [finca San Carlos]*, prepared by Fiallos & Asociados, July 2011
- *Estudio de Impacto Ambiental de Línea de Transmisión de Alto Voltaje y la Subestación Parque Eólico Eolonica Wind Power [finca El Limon]*, prepared by Fiallos & Asociados, July 2011
- *Documento de Impacto Ambiental de Línea de Transmisión de Alto Voltaje y la Subestación Parque Eólico [finca El Limon], Rivas, Nicaragua,* prepared by Fiallos & Asociados, July 2011 (non technical summary which was publicly available through MARENA)
- *Diagnóstico del estado de composición de las poblaciones de aves (residents – migratorias) y murciélagos en el complejo eólico "Eolonica", al sur de la ciudad de Rivas, Nicaragua,* prepared by Zolotof-Pallais et al., 3 November 2011
- *Environmental and Social Appraisal: Eolonica Wind Farm Project, Rivas, Nicaragua,* prepared by Gerencia Ambiental Internacional, S.A., 19 December 2011

- *Final Report Lender's Due Diligence – Eolo Wind Project, Rivas, Nicaragua*, prepared by Nordteco, 13 February 2012
- *Diagnóstico del estado de composición de las poblaciones de aves (residents – migratorias) y murciélagos en el complejo eólico "Eolonica", al sur de la ciudad de Rivas, Nicaragua,* prepared by Zolotof-Pallais et al., May 2012
- *Environmental Management Plan / Plan de gestión ambiental: Proyecto Eólico Eolo de Nicaragua* prepared by Globeleq Mesoamerica Energy, March 2012
- Labour policies prepared by Eolo and by key contractors (i.e. COPERCO)
- EHS policies and procedures prepared by Eolo, including the Emergency Preparedness and Response Plan dated April 2012 *(Plan de Respuesta en Caso de Emergencia)* and the Community Relations plan dated May 2012 *(Plan de Relaciones Comunitarias).*

MIGA's review of this project also comprised of email exchanges with GME Wind, Eolo, and lenders on various environmental and social management topics including bird and bat studies and tower locations, as well as general and EHS related project information.

E. Key Issues and Mitigation

PS1: Social and Environmental Assessment and Management Systems

Social and Environmental Assessment: Before finalizing the layout and design of the project, environmental impact assessments (EIA) were submitted to the Ministry of Environment and Natural Resources (MARENA) for a transmission line and substation located on each farm (i.e., San Carlos farm and El Limon farm), and an environmental management plan (EMP) for a wind farm located on San Carlos farm. As the project design was finalized, an EMP was prepared for the wind farm on both San Carlos and El Limon; and an EIA for the transmission line and substation located on El Limon was submitted to MARENA. Since the acquisition of the Eolo project by GME, all environmental permits (and their conditions) have been consolidated and re-issued in February 2012 under Eolo de Nicaragua, S.A. Although the various impact assessments considered a slightly larger generating capacity wind farm, this environmental and social review summary is focused on a 44 MW wind farm.

In addition to the EIAs and EMP, Eolo is currently carrying out a background noise study as well as a landscape / habitat mapping study. Bird and bat baseline studies prior to operations have also been carried out during the fall and spring migration. Bird and bat monitoring will continue during the fall and spring migration for the first two years of operations and then will continue as needed. Further detail regarding potential impacts to biodiversity and natural resources are discussed under PS 6.

GME Wind's Code of Conduct is applicable to the Eolo project, including contractors. This Code has been approved by the General Manager of GME Wind and together with the written employment agreements cover such topics as business ethics (including conflict of interest and non disclosure of confidential information), accident prevention, environmental protection, and equal opportunity employment. Eolo has developed principles for its environmental policy which are currently under review by senior management. Gamesa has a comprehensive Occupational Health and Safety, Environmental and Quality Policy applicable to the Eolo project.

Management Program and Monitoring: Eolo's EHS management program is comprised of its environmental management plan and the adoption of Gamesa's health and safety plan. Supporting procedures have been developed and ongoing monitoring is carried out to ensure compliance with the project's EHS commitments. Eolo's management program will continue to improve and be strengthened in the areas of mitigation and monitoring measures.

Sub-contractors report to Gamesa (the EPC Contractor) who then reports to Eolo. An EHS committee has been formed to address EHS compliance and weekly planning. Daily inspections are performed and followed up by reports. Gamesa has a commitment to and has a good understanding of EHS issues and appropriate management systems and controls to mitigate and manage these impacts. EHS and labour managers are onsite during construction and will also be onsite during operation.

The environmental authorizations from MARENA require monthly reporting during construction and operation. During construction Eolo prepares a monthly construction report for the lenders, which includes a detailed EHS reporting section. During operations an internal monthly operations report will be prepared. Quarterly operational reports (including EHS updates and reporting) are required by the lenders and also will be required by MIGA. A more detailed annual environmental and social performance monitoring report will be required by MIGA and lenders during operations.

GME Wind plans to carry out internal compliance audits of this project, once during construction and annually during operations to verify EHS performance. GME strives to continually improve wind farm operations and thus will incorporate best practices in EHS into its standard operating procedures to be used for future projects. Lessons learned from one project will be disseminated to other projects to ensure continuous improvement.

Organizational Capacity and Training: Eolo provides overall EHS supervision and oversight for the project and has appointed an Environmental Coordinator to manage project consultants, liaise with contractors, and oversee reporting and permitting requirements. The Coordinator reports directly to Eolo's Construction Manager. Eolo was required to create this position as part of its permit conditions with MARENA. The Environmental Coordinator is supported by field staff as well as GME Wind's head office staff. This unit has recently been staffed and will continue to develop as the project progresses. Health and safety issues are handled by the Eolo Health and Safety Coordinator, who reports to Eolo's Construction Manager. As described under PS 2, EHS training is provided to all workers before staring their jobs.

PS2: Labor and Working Conditions

Human Resources Policy and Management: Nicaragua has ratified the eight fundamental International Labour Organization (ILO) Conventions addressing forced labour, freedom of association and protection of the right to organize, collective bargaining, equal remuneration, non discrimination, and minimum age.

Construction is expected to take approximately one year and at peak, will employ approximately 400 workers, with the majority being from Nicaragua and approximately 66% from the local project area (San Juan and Rivas). Workers in the area are familiar with wind farm construction

as other wind farms in the area have recently been constructed. Once in operation, the project is expected to employ approximately 20 full-time staff.

Eolo has established a written internal labour policy ("Reglamento Interno de Trabajo") which addresses the main ILO conventions and in the process of being approved by the by the Nicaraguan authorities. The policy and written employment agreements include a code of employment for workers which explains the workers' rights and the company's obligations, and it addresses terms of employment, working hours and overtime, training, leave, grievance redress, employee welfare, disciplinary action, health and safety, and wages and benefits. Probation period lasts thirty (30) days before permanent employment is offered. COPERCO will hire the majority of the workers for this project. Its human resources policy is in line with Nicarguan and PS 2 requirements, and is communicated to new employees as part of the hiring process when contracts are issued. Eolo and all contractors verify national identity cards to ensure that all workers are over eighteen years of age. COPERCO pays its workers according to the collective agreement for the construction sector and all workers earn at least the minimum wage. Under COPERCO's policies work grievances can be raised verbally or documented with the general manager, who will follow up accordingly. Eight union representatives are part of COPERCO's workforce.

Eolo will verify contractors (including site security personnel) are following overtime requirements to identify any restructuring of shift work to ensure compliance with national labour laws and PS 2. Day labourers are not hired by the project. Reporting on labour and working conditions for Eolo and contractors will be required as part of the project reporting to MIGA.

Occupational Health and Safety: Gamesa's health and safety plan has been approved by Eolo and is applicable for this project; all workers are to abide by this plan. The plan includes management systems, roles and responsibilities, and site procedures. All workers are provided EHS training as part of their induction, and refresher courses are offered. Personal protective equipment is provided to all workers, and the project site is adequately signed. Job hazard analysis and specialized training is given to those undertaking higher risk tasks such as working at heights and working near live power lines. Only qualified specialists will be working near live electricity, and lock out procedures will be strictly enforced.

Unannounced simulations are carried out in the field to practice implementing the project's emergency preparedness and response procedures. Approximately sixty workers have been trained by the local fire department and serve as the fire and safety brigade onsite. In addition, COPERCO has been certified by the fire department for receiving fire fighting training. Arrangements have been made with the Rivas Hospital to provide medical services as needed, and ambulance service is about 10-15 minutes away. Either doctors or paramedics will be onsite during higher risk activities such as, wind turbine erection and high voltage overhead line works. Portable first aid boxes are available onsite and inventory is checked weekly. Safety induction meetings are regularly conducted and health and safety staff are present on the construction site. An emergency preparedness and response plan has been developed for construction and for the operations, as required under Law 618 for occupational health and safety. Incident investigations and internal compliance audits will be carried out. Since commencing construction, approximately 235,000 working hours have passed with no lost time injuries or accidents recorded. There is no worker accommodation onsite.

Potable water is available to workers onsite and water used in the food preparation area is regularly tested. There is no long-term storage of perishable goods onsite as meat is kept in the offsite freezer until needed. Kitchen facilities are organized into separate food preparation and clean up areas, and a fire extinguisher is located near the cooking facilities.

PS3: Pollution Prevention and Abatement

An overview of Eolo project's mitigation measures for preventing and abating pollution are summarized below. Environmental impacts during the construction phase will be temporary in nature. Environmental impacts during operations will be controlled through mitigation and operational procedures which will be developed more fully prior to operations and submitted to MIGA.

New access roads to individual turbines will be established. Road construction and expansion, and the foundations for the WTGs and the substation will require proper drainage and erosion control. Excavated material generated during construction will be reused for local landscaping and internal road construction, and is temporarily stored onsite away from watercourses with topsoil separated. Onsite borrow material will be used for project roads. Any land disturbed and excavated during construction will be re-contoured, replanted, and returned to its original state as quickly as possible, and procedures will be included in a revegetation plan.

Hazardous goods such as diesel and oil are stored in a covered and controlled storage area which is bermed to minimize uncontrolled release. There are two portable diesel fueling trucks which are licensed by MARENA to be used onsite for refueling heavy equipment. Most vehicle maintenance is carried out offsite except for minor preventive maintenance such as oil changes. Minor maintenance is carried out in a designated site away from water courses. Used oil and oil filters are collected and returned to a licensed recycler. Contaminated soil is hauled by licensed contractor to an incinerator in Managua. During operations, SF6 will be used to insulate equipment in the substation; appropriate management and monitoring controls will be implemented to prevent accidental release to the atmosphere as it is a potent greenhouse gas. The project is not authorized to use pesticides or agrochemicals. The project does carry out mosquito control onsite.

Domestic waste is recycled as appropriate and hauled offsite to a licensed landfill or recycling facility. Improvements will be made to waste management signage and labeling to encourage better segregation of waste.

Potential noise impacts caused by the wind turbines during the operation phase to the adjacent communities are not expected to be significant as the nearest resident to a turbine is approximately 800 m which is more than the average distance recommended by best industry practices for a wind turbine with a height of 78 m and blades of 40 m.

Wind towers and complementary equipment will be painted in light colours to minimize visual impact. In addition, connection cables between towers will be buried to avoid impacts to landscape and fauna. Wind towers will be located so as not to be on a parallel line to the Pan-American highway.

It is anticipated that electricity from the existing transmission line will provide the power necessary during commissioning of the WTGs; however, diesel generators will be brought to site if warranted. Should generators be used, diesel will be appropriately stored and managed, and generators will be kept in good working order to minimize air and noise pollution.

Environmental impacts related to the substation and 200 m transmission line are expected to be minimal. PCBs will not be used in transformers for the substation. Transformer oil will be pure mineral oil without additives. The electricity collection system from the WTGs to the substation will be buried except for two above ground crossings. Batteries will be used for back-up power at the substation's control rooms. Disposal of batteries will be through a licensed third party recycler.

The project has estimated CO_2 reductions of approximately 113,366 tCO_2e per year during the seven year crediting period being sought under the Clean Development Mechanism.

The Eolo project will carry out its activities in accordance with the environmental impact assessment, the environmental management plan, the health and safety plan, the conditions set out in the various environmental approvals, and in compliance with MIGA's Performance Standards on Social and Environmental Sustainability and EHS Guidelines.

PS4: Community Health, Safety & Security

The closest community to the Eolo project is La Virgen (population about 4,000 residents), approximately 800 m away; therefore impacts related to shadow flicker, blade glint, operational noise disturbance, or malfunction of the wind turbines such as blade throw is expected to be low. Construction impacts on nearby communities are expected to be minimal as dust is controlled by watering the site, and night-time construction activities will be limited to those activities with noise emissions not exceeding national and WBG night time noise level guidelines.

The components for the WTGs (e.g., nacelle, transformer, towers, etc.) will be transported from the existing Port of Corinto to the site along the Pan-American highway. About seven trucks per convoy will be escorted by police and will travel the 10-12 hours at night, as per the request by Nicaraguan authorities to minimize traffic flow disturbance. The same transportation route used by other wind farms in the region will be used for this project; in the past, no logistical issues were encountered. Access to the project site is directly from the Pan-American highway and access to the project turbines will be by six meter wide (controlled access) roads.

Risks related to tropical cyclones and seismic events were reviewed and these considerations were incorporated in the project's design according to industry standards. The design of the WTG platforms took into consideration potential temporary flooding in some of the flat areas during very heavy rains. Lightening attractors will be installed in the WTGs, grounding wires will be attached to transmission towers, and surge arrestors will be used on the transmission lines to control potential lightening strikes.

Most of the electrical connection system for the project will comprise of buried cables except for two elevated stream crossings. Interconnecting the substation to the national grid will be

coordinated with Enatrel, the state owned transmission company, to minimize the length of power outages and to ensure worker safety.

The wind turbines will operate continuously at wind speeds between approximately 4 m/s and max 25 m/s. At speeds greater than 25 m/s, the turbines automatically shut off for safety reasons. The turbines will be equipped with safety alarms and connected to a network of safety instruments and communication devices that can be used for remote monitoring by Eolo and others. The fire protection system at the wind farm is an integral part of the project design. A fire alarm system will be used at the substation. As part of Eolo's emergency preparedness and response plan, in addition to working with local authorities, other wind farm operators in the region have informally agreed to cooperate during unlikely larger emergency situations.

Security Arrangements: Vehicle and project worker access to the site is controlled through a main gate, although farm workers have access to the project area by entering the farms' property. COPERCO has contracted the site security (armed) during the construction phase. The private security company is registered by the police and training is part of the licensing for the administration of special weapons. Armed security will continue during operations, and security cameras will also be installed at each turbine. Once operational, the substation will be fenced and access will be controlled. Eolo will develop a security management policy consistent with national and PS 4 requirements for the project and a copy of such policy will be submitted to MIGA.

PS5: Land Acquisition & Involuntary Resettlement

No physical resettlement is needed for the Eolo project as it is located on agricultural lands. The project is located on two neighbouring farms, San Carlos and El Limon farm properties. All right-of-uses and lease agreements have been negotiated on willing lessee (user) and willing lessor (owner) basis with each land owner, and compensation has been mutually agreed to and included as part of the agreements. Land use agreements are for a thirty year period with a possible renewal if both parties mutually agree.

PS6: Biodiversity Conservation & Sustainable Natural Resource Management

The project is located on highly intervened agricultural land with no critical habitat or environmentally protected areas within the project's area of influence; there is limited land use conversion associated with this project. Eighteen WTGs will be located near the lakeshore (respecting the company's 30 m buffer from the high water mark of the lake), and four WTGs will be located on the other side of the highway. Baseline environmental studies have identified several species of conservation concern in the project area such as the American crocodile (classified as vulnerable per the IUCN Red List), and mantled howler monkey; however, project impacts are expected to be minimal for these species. A survey of the trees has been carried out to identify protected tree species to preserve (e.g., Cedro (*Cedrela odorata L.*) and Ceiba (*Ceiba pentandra*) trees). These trees have been marked in the field and WTG platforms and access roads have been located so as to avoid cutting protected tree species. Tree cutting permits have been received by the National Forestry Institute (INAFOR). Two stream crossings for the collection system line are needed and have been sited to minimize environmental disturbance to the stream and/or to habitat. In addition to forbidding hunting or disturbance of wildlife by

workers, the company has committed to developing a biodiversity management plan and to carrying out a landscape study to assist in identifying possible areas of habitat improvements (such as reestablishing biological corridors along the river banks) through the project's reforestation efforts. Reforestation choices will be guided by choosing native species which can offer ecosystem services such as food or habitat. Areas of higher biodiversity sensitivity which will be identified through the landscape study will be flagged in the field and also marked on site maps so as to minimize disturbance. It is recommended that this activity is carried out soon before construction activities are well underway.

The Isthmus of Rivas is an important migratory flyway for numerous species of birds, including raptors and six species of swallows. Bird and bat baseline surveys were conducted by a qualified ornithologist in the project area during the 2011 fall migratory period and the 2012 spring migratory period. Based on transects and point counts carried out for the survey, the estimated flight altitude of the birds, direction of flight, and behavior were recorded, as well as identification of sites that represents an attractant for birds and the identification of birds (Latin name, migratory or resident, conservation status). Bat surveys estimated the total population of bats present at the site and identified species (resident or migratory, frugivorous or insectivorous, conservation status), flight route and habits and habitat characterization. The 2011 Fall Migration study identified 68 bird species and the 2012 Spring Migration study identified 56 bird species, including resident, migratory, and passing species. The most abundant bird species identified were the barn swallows. Eleven bat species were identified in the fall study and 19 species identified in the spring study. None of the migratory or resident bird and bat species are known to be threatened, endangered, or endemic according to the IUCN Red list. Based on these studies, few species were seen in the anticipated blade sweep area of influence, and those species that were seen are ones which can share various ranks of height, such as raptors who make use of the entire vertical stratum. Towers will be spaced a minimum of 200 m apart to ensure bird and bat mobility around WTGs. Anecdotal evidence suggests that the neighbouring wind farm operating since 2009 has not experienced significant bird or bat mortalities; Eolo is encouraged to share monitoring information with other operators in the area, as well as report mortalities to MARENA as required.

Proposed mitigation measures to minimize bird and bat impacts include anti-perching devices on the WTGs, lowering the spinning speed of the blade during certain times of the year or day, installing low intensity lighting which meets safety and security requirements, and considering shut down procedures for certain times of the year should continuous high mortalities be detected. Mitigation measures will also be taken for the substation and 200 m high voltage transmission line, including insulating the lines, and using bird deflectors where appropriate. A robust monitoring program is currently being developed for the WTGs, the substation, and the transmission line. In addition to direct habitat loss, reduction in habitat suitability, resulting from aversion to the presence of the turbines, associated infrastructure and other disturbance caused by wind farm, will also be considered. Injuries and mortalities resulting from interactions with turbine structures will be monitored and assessed to determine if potential exists for impacts on key species. Although attention is focused on priority species, the monitoring program will need to account for subtle impacts associated with wind energy by including monitoring of small bird populations and certain non-threatened but impact susceptible species. The company has committed to independent review of monitoring protocol and data. Project personnel will be trained by a qualified specialist how to search for injured species and carcasses and how to correct for search efficiencies and scavenging rates. Biodiversity monitoring will be included in monitoring reports required by MIGA.

Although cumulative impacts were not assessed as part of the EIAs or EMP carried out for the project, cumulative impacts for this project have been considered. Based on limited current information, cumulative impacts on birds and bats are not expected to be significant for this wind farm as the nearest wind farm is about 3 km away. The migratory routes are broad and not restricted to the project site. MARENA has not yet identified significant adverse cumulative impacts for this area. As part of the project's monitoring program, adverse direct impacts will be monitored as well as identifying potential cumulative impacts, and where identified, these impacts will be monitored. For any future extension (including up to the licensed 60 MW capacity), the Eolo project will ensure that cumulative impacts of this site, as well as potential cumulative impacts from neighbouring wind farms, are assessed and mitigated in a manner consistent with MIGA's Performance Standards. Eolo is also encouraged to coordinate and share ongoing bird and bat monitoring information with other wind farm operators in the same area and is required to report this information to MARENA.

F. Environmental Permitting Process and Community Engagement

According to Nicaraguan Law 217, the development and operation of a wind farm (i.e., Category III project) requires an environmental management plan, and the development and operation of transmission lines and substations (i.e., Category II project) requires an environmental impact assessment. This project was originally located on the San Carlos farm but later expanded to include the neighbouring El Limon farm. Environmental documentation submitted to MARENA originally comprised of EIAs for the respective transmission lines and substation required for each farm, an EMP for the development and operation of the San Carlos wind farm, and an EIA for the development and operation of the El Limon wind farm. Based on this documentation, environmental licenses were granted by MARENA. Since that time, the project now includes WTGs to be located on both farms and the transmission line and substation to be located on the El Limon farm. Updated environmental documentation was submitted to MARENA for review, and all approvals have now been consolidated under two permits issued in February 2012 for the Eolo Wind Farm project, one license for developing the wind farm and one license for the associated transmission line and substation to connect to the national grid. These consolidated permits incorporate the final modifications in design / layout, the number and capacity of the WTGs, and recognize the current sponsor of the project. Although the EIAs were not required to include a formal public hearing, a non technical summary (in Spanish, Documento de Impacto Ambiental) was publicly available through MARENA for the transmission line and substation located on the El Limon farm. There was no public opposition to the project registered with MARENA. MARENA is carrying out once monthly site visits during construction to verify the project's environmental performance against its permit conditions, EMP, and EIA commitments. Monthly reporting to MARENA is required during construction.

Community engagement and consultation has been carried out for this project, including as required under the UNFCCC Clean Development Mechanism (CDM) and as part of the ongoing environmental and social assessment studies. Stakeholder consultations were carried out on Monday, October 10, 2011 in Rivas to fulfill the CDM requirements for consultation. Stakeholders included representatives from local government, universities, schools, non-governmental organizations, and neighbours of the project, and main representatives of the local government from other communities of Rivas's Department. This meeting was announced by MARENA and the project sponsor in a national newspaper (La Prensa). More than twenty-five participants attended the meeting and topics raised included: potential impacts to birds from this

project and from other existing projects in the same area, location of the WTGs and substation, details of the contract agreement with the landowners, types of community development initiatives, status of the various permits, emergency response capabilities, and job opportunities and qualifications of local people. Each question received satisfactory and comprehensive answers by the project developer. No comments were submitted directly to MARENA during this consultation period. The Project Design Document (PDD) for the Eolo project is available through the UNFCCC website. The PDD is currently undergoing the validation process as part of the CDM registration.

Eolo also held a community meeting in La Virgen in May 2012 to update the residents on the project layout and to explain the timing of various construction activities. The company has developed a grievance mechanism which was disseminated to the community and is posted onsite at the Eolo offices. All grievances are documented and filed (including a description of the follow up action). Eolo's Community Relations Plan includes ongoing transparent community consultations throughout the construction and operations phases of the project by means of ongoing regular meetings, project updates, and organized tours of the project site.

The project has developed criteria against which to assess community development initiatives. Community development initiatives have focused on assisting local schools. Ongoing community development will be coordinated through established NGOs in the project area as well as continuing to provide direct support for various initiatives in consultation with local communities. This approach will be reflected in the company's community development plan.

G. Availability of Documentation

The following documentation is available electronically as PDF attachments to this ESRS at www.miga.org:

- *Proyecto Eolo de Nicaragua, 60 MW Programa de Gestión Ambiental [finca San Carlos]*, prepared by Mauricio Lacayo, November 2009
- *Estudio de Impacto Ambiental Eolonica Wind Power [finca El Limon]*, prepared by Fiallos & Asociados S.A., March 2011
- *Estudio de Impacto Ambiental de Línea de Transmisión de Alto Voltaje y la Subestación Parque Eólico Eolonica Wind Power [finca El Limon]*, prepared by Fiallos & Asociados, July 2011
- *Documento de Impacto Ambiental de Línea de Transmisión de Alto Voltaje y la Subestación Parque Eólico [finca El Limon], Rivas, Nicaragua*, prepared by Fiallos & Asociados, July 2011 (non technical summary which was publicly available through MARENA)
- *Diagnóstico del estado de composición de las poblaciones de aves (residents – migratorias) y murciélagos en el complejo eólico "Eolonica", al sur de la ciudad de Rivas, Nicaragua,* prepared by Zolotof-Pallais et al., 3 November 2011
- *Environmental Management Plan / Plan de gestión ambiental: Proyecto Eólico Eolo de Nicaragua* prepared by Globeleq Mesoamerica Energy, March 2012
- *Diagnóstico del estado de composición de las poblaciones de aves (residents – migratorias) y murciélagos en el complejo eólico "Eolonica", al sur de la ciudad de Rivas, Nicaragua,* prepared by Zolotof-Pallais et al., May 2012

Project environmental and social documentation is also available for viewing at the following locations in Nicaragua:

- Globeleq Mesoamerica Energy office in Managua: Edificio Discover, Villa Fontana, Modulo 1 Del Semáforo del Club Terraza, 1 Cuadra al Sur, Managua, Nicaragua
- Eolo project office near Rivas: Kilometer 123 of the Pan-American Highway, south of the city of Rivas, Rivas.