

Serra da Babilônia Windfarm - Guarantee

Review of Environmental, Social, and Labor Issues

Environmental Review:

Rio Energy (the “Client” or “Sponsor”) is the owner and controller of ‘Serra da Babilônia’ wind farm park with a combined capacity of 223.25 MW, as well as a transmission line and other facilities (the “Project”), to be located in the municipalities of Morro do Chapéu and Várzea Nova, in the central region of the state of Bahia in Brazil known as Chapada Diamantina. The Project was awarded a 20-year power purchase agreement by the Trading Chamber of Electric Energy, ‘CCEE’, in 2015. The wind farm consists of 95 aerogenerators (of 2.35 KW each); a 34.5/230kV substation and underground and aboveground circuit; a 75Km 230kV transmission line connecting to the Morro do Chapéu II substation, and 62Km of external and internal access roads. Total project cost is estimated at BRL 1.48 billion (approximately US\$ 463 million), and the IDB/IIC will provide a credit guarantee for debt instrument issued to finance the Project’s construction.

1. General Information and Overview of Scope of IIC Environmental & Social (E&S) Review.

The IIC scope of review during the Rio Energy’s appraisal included review of two ESIA’s (for the Transmission Line and Windfarm), occupational health and safety plans, emergency response plan, environmental and social management plans, communication plans, management records, permits and licenses, human resources policies and sustainability policy, among others for the construction and operational phases of the Project. IIC’s E&S specialists conducted 3-day site visit (October 2-6, 2017), which included the following activities: 1) meetings and interviews with Rio Energy’s directors, managers, E&S personnel and consultants, Project directors and managers; 2) meetings with representatives from the quilombola community Lapinha; 3) meeting with the protected area *Parque Estadual Morro do Chapéu* manager; 4) field visit to the windfarm, transmission line and surrounding areas; and 5) conference calls and meetings with Rio Energy before and after the site visit.

2. Environmental and Social Categorization and Rationale

Key environmental and social impacts associated with this type of operation include air emissions, solid waste, liquid effluent discharges, noise, handling of hazardous materials, terrestrial biodiversity, water quality, greenhouse gases (GHG) emissions, land acquisition/easements, and community related impacts and risks during construction and operation. The proposed Project has been classified as Category B per IIC’s Environmental and Social Sustainability Policy.

3. Environmental and Social Context

There are no residents at the Project windfarm site. The land where the Project is located belongs to two estates: *Fazenda Flor do Sertão* (708 hectares) and *Fazenda Bom Jesus* (4,295 hectares) in the municipalities of Morro do Chapéu and Várzea Nova in the State of Bahia. Both *fazendas* belong to a single owner who has leased the land to the project holding company for 35 years, 15 years on top of the duration of the PPA. The closest settlements to the Project are São Bento in the municipality of Ouroândia, and Tábua and Várzea de Fora in the municipality of Várzea Nova. Access to the Project

area is through a road already significantly improved by the client. Along the route of the future Transmission Line (TL), in its area of indirect influence, there are some 38 certified *quilombola* communities - but only four of those are near it. The TL is about 75km in length with a 40-meter wide right-of-way, totalizing some 296 hectares of land. The TL goes through four municipalities (Morro do Chapéu, João Dourado, América Dourada and Cafarnaum).

Landowners in the Project's windfarm surrounding area and along the TL are, in their majority, small farmers devoted to subsistence agriculture, cultivation of sisal to produce ropes and cattle, goats and sheep raising. There are also some localized extractive activities of marble and nonmetallic mining. Project controller, Rio Energy, has a social policy to invest in the communities located closest to the Project as well as in the most vulnerable communities with projects that have regional scope. Rio Energy is developing a social program for the Project, aligned with its main creditor (BNDES), which is expected to benefit several communities. The initial draft of the Social Program includes investments in construction of water supply and sanitary infrastructure, community and sport centers, laboratories for clinical analysis, x-rays rooms, and creation of a youth network and training center. These investments have directly benefited over 1,340 people.

The Project's area of influence is characterized by a mosaic of both natural and modified habitats under extensive cattle and goat grazing, with severely limited water availability that impede other, more intense economic activities. There are two protected areas in the Project's area of (indirect) influence. The sustainable use 'Área de Proteção Ambiental Gruta dos Brejões (APA)', an 11,900-hectare reserve that derives its Portuguese name from its main features: natural caves and associated archaeological heritage; and it is located some 10Km northwest of the windfarm, downslope a steep ridge. The other protected area is the State Parke "Parque Estadual Morro do Chapéu", a 46,000-hectare protected area that is also an Important Bird Area (IBA, for endemics)¹, located about 15km south of the windfarm.

4. Environmental Risks and Impacts and Proposed Mitigation and Compensation Measures

4.1 Assessment and Management of Environmental and Social Risks and Impacts

a. E&S Assessment and Management System (ESMS)

IIC's appraisal considered the E&S management planning process and documentation for the Project, as well as gaps between the project planning process and IIC's E&S requirements. Where necessary, corrective measures, intended to close these gaps within a reasonable period of time, are summarized in the paragraphs that follow, in an Environmental and Social Action Plan (ESAP) mutually agreed with the Client. The Project is implementing a comprehensive management system in accordance with the international standards such as ISO 9001, OHSAS 18001, Equator Principles and IFC Performance Standards, the Environmental Permit, as well as other Brazilian legislation that covers environmental, social and archeological and health and safety risks. The current ESMS system for managing the Project incorporates lessons learned from previous experiences developing the windfarms of *Complexo Eólico Itarema* and *Complexo Eólico Caetité*.

b. Policy

Rio Energy has developed a corporate Sustainability Policy that defines the environmental, health and safety and social responsibility objectives and principles that guide its operations; this policy defines

¹ <http://datazone.birdlife.org/site/factsheet/parque-estadual-do-morro-do-chap%C3%A9u-iba-brazil> The APA is a category V (i.e. direct, sustainable use) IUCN protected area, and the state park is a category II (strict conservation) IUCN protected area.

eleven principles aligned with standards ISO 14001 and OHSAS 18001 and beyond, such as: Leadership and Accountability; Legal Compliance; Impacts and Risks Management; Contractors and Suppliers Management; Operational Control; Competency and Training; Communities Relationship; Incidents Analysis; Emergency Response; performance Monitoring; and, Continuous Improvement.

c. Identification of Risks and Impacts

Rio Energy identified and assessed environmental and social risks and impacts in both the ESIA for the windfarm and the TL, completed in alignment with the methodology prescribed by federal regulation (*Resolução CONAMA nº 001/1986*), despite the fact that completion of a full ESIA was not legally required, at the state level, in order for the state agency INEMA to grant Serra da Babilônia an environmental permit. The ESIAs present an identification and evaluation of the impacts during planning, construction, operation and decommissioning (the latter for the windfarm only).

i. Direct and indirect impacts and risks

Positive Project impacts include: increase in tax revenues, employment generation (mostly during construction), access to infrastructure and new equipment, greenhouse gas emission reductions (during operations) and increased renewable energy into national power system. Negative impacts include: land use change, erosion, landscape modification (e.g. interference with karstic materials), vegetation removal and localized habitat change; traffic increase and population exposure to accidents and incidence of new diseases; wind-wildlife interaction and collisions with birds and bats (operations). Given the predominant water scarcity in the region, there is a need to adequately assess impacts of water consumption via wells during the construction phase of the Project (ESAP action 01).

The Project does not entail significant social risks. There are four *quilombolas* or traditional afrodescendant communities within the TL's area of direct influence (2.5 km) (see below). These are the communities which are closer to the footprint of the TL and hence any civil works the Project will execute.

ii. Cumulative impact analysis

Cumulative impacts associated with both the windfarm and TL were not assessed, whereas the Project is located in a region considered attractive for the development of windpower, and where several other projects are already operating². Rio Energy will therefore prepare a cumulative impact assessment based on secondary information, contemplating at least the topics detailed below (ESAP action 02).

iii. Analysis of alternatives

A robust analysis of alternatives for the TL alignment was completed, evaluating the following criteria: i) line length and estimated number of towers; ii) accessibility; iii) proximity to urban or rural population settlements, including rural settlement projects and *quilombola* communities; iv) biodiversity conservation priority areas; v) Interference with protected areas; vi) Interference with speleological heritage; vii) Interference with water bodies; and viii) vegetation clearance. The chosen route minimized overall impacts, with the selected alignment avoiding the protected area *Unidade de Conservação de Proteção Integral – Parque Estadual Morro do Chapéu* and its buffer zone.

d. Management Programs

The Project will have three major EPC contractors: 'Dois A' for the civil works of the windfarm, WEG for electrical works including the private substation and 'Tabocas' for the construction and installation of the transmission line. Contractor 'Wobben' has been engaged for the wind turbines supply and

² Sistema de Informações Geográficas do Setor Energético Brasileiro (<https://gisepe.epe.gov.br/WebMapEPE/>)

operation and maintenance (O&M) for 12 years. Construction phase will take about two years and Project life cycle is expected to be between 25-30 years.

Rio Energy developed a number of environmental and social management plans (ESMP) to address environmental, social, archeological and health & safety aspects and impacts associated to the Project and identified in the ESIA. Key ESMPs include waste management, flora and fauna rescue and relocation, traffic management, dust control, noise, erosion control, vegetation suppression, archeological findings rescue, forest repair, social communication, environmental education, hiring and training of local hand-labor, emergency response, archeological monitoring and rescue, among others. Rio Energy has also contracted specialized companies to undertake some specific ESMPs, including construction environmental program, fauna and flora monitoring and rescue, archeological monitoring and rescue.

Although some of the ESMPs are operationalized by contractors, the implementation of these plans is of Rio Energy's responsibility. Hence, Rio Energy monitors the implementation and permanent monitoring of the ESMP results through the following measures: i) permanent supervision and implementation in the Project's area with a team of field-based direct employees, comprised by six people (dedicated to land management, socio-environmental supervision and health & safety supervision); ii) hiring of specialized companies to undertake specific programs, such as construction environmental program, fauna and flora monitoring and rescue, archeological monitoring and rescue.

e. Organizational Capacity and Competency

In order to establish the required level of education and experience for each role in the organization, Rio Energy developed job descriptions. Rio Energy has created a Sustainability Department led by a qualified manager who joined the company in March 2015. The manager is supported by a team of three coordinators (social, environmental and permitting) who in turn are supported by six analysts, both field- and office-based. The Sustainability Department is also supported by various external E&S consultants who have conducted the E&S baseline studies and impact assessments and have been contracted to conduct E&S monitoring programs such as flora and fauna, air quality, noise, etc. (as above). This team is responsible for managing the implementation of E&S programs by the contractors and overseeing their performance, ensuring regulatory compliance, implementing compliance audits, stakeholder engagement, grievance, and E&S monitoring and record keeping, management and documentation among others.

f. Emergency Preparedness and Response

The Project developed an Emergency Response Plan (ERP) which scope includes all different emergency scenarios that may occur involving the companies and facilities associated with Serra da Babilônia Project. The ERP includes the participation of the different contractors and communities within the area of influence of the Project (e.g. Ourolândia, Tábua, Várzea de Fora). In order to ensure an adequate skills set for those tasked with responsibilities in the emergency response, Rio Energy completed a selection process and provided training as needed, including first aid and firefighting. The ERP also establishes 14 potential emergency scenarios, including spills, fire, traffic accidents among others, and the respective response flow charts, an emergency drill schedule and identifies the employees with special needs.

g. Monitoring and Review

Monitoring plans referenced in the ESIA's are being implemented by the Project as part of their commitments established in approved permits, covering aspects such as solid waste and liquid effluents, noise, biodiversity, social aspects, water consumption, among others. In addition, a number of indicators have been established including the same aspects. Reviews and supervision are

completed in a daily basis in the field, and are being recorded in a monthly basis. However, Rio energy needs to include the development and implementation of a GHG emissions inventory and quantities estimations (ESAP action 03).

h. Stakeholder Engagement

Stakeholder Mapping, Analysis and Engagement Planning - Informed Consultation and Participation

The Project has been identifying the main stakeholders near both the windfarm Project site as well as along the TL alignment since October, 2016. Those are located in the settlements of Sao Bento (320 inhabitants), Tábua (800 inhabitants) and Várzea de Fora (60 inhabitants). Their livelihoods depend on subsistence agriculture and cattle raising as well as on marble extraction. Along the TL some 28 *quilombola* communities have been identified in the territories of the affected municipalities. However, only four *quilombola* communities are within the TL's area of direct influence (i.e. within 2.5km from the alignment). These are small communities: Serra Azul has 60 inhabitants and is located 2.4km from the TL, Angicão has 70 inhabitants and is 2Km distant from the TL, Canabrava has 360 inhabitants and is located 1.5km from the TL, and Lapinha has 113 inhabitants and is located 0.6km from the TL. These communities' livelihoods depend on subsistence agriculture, irrigated crop cultivation and goats and sheep raising.

Since the beginning of the stakeholder mapping and analysis process The Project has engaged the communities in a participatory manner, through a communication process to convey information on the Project, which has included understanding of negative impacts but also positive ones e.g. opportunities for local employment. These efforts have resulted in the development of several social development programs, including a social communication program that has created a Project Follow-up Committee (*Comissão de Acompanhamento do Empreendimento*), composed by 21 members including Client representatives, INEMA officials, representatives from the municipalities and grass root organizations. The objective of this Committee is to promote an ongoing dialogue related to Project execution and local interests. An additional Committee has been created specifically for the four *quilombolas* communities closest to the TL's alignment (*Comissão de Acompanhamento Quilombola*) with eight representatives from these communities. There is an ongoing process of consultation with these *quilobolmba* communities that will eventually end up in agreements for support to community projects. This ongoing dialogue has already enabled outcomes regarding the identification of community priorities and potential support to community projects. To validate these, *Fundação Cultural Palmares* -which is the federal government entity responsible for traditional communities- needs to approve the agreements that have been reached.

External Communications and Grievance Mechanisms (GRM)

A Communications Program has been in effect since October 2016. This program has included several leaflet publications, meetings with the identified stakeholders, workshops on environmental issues for local schools and local organizations, and training of local workforce. A GRM is in place through a dedicated phone line, a dedicated email address and through a special WhatsApp line. Rio Energy has also two offices, one in Ourolândia and the other in Várzea Nova to provide information and receive and attend questions and complaints.

Disclosure of Information and Ongoing Reporting to Affected Communities

Before this Project started, another transmission line belonging to a different wind energy project was installed, following the same alignment route of that planned for Serra da Babilônia. The company responsible prepared social assessments for the same *quilombola* communities. Rio Energy has requested permission from *Fundação Cultural Palmares* (FCP) -- to use those same social assessments

to be in compliance with the national legal framework, and is awaiting FCP's response. A meeting between Rio Energy and FCP has been slated for December 2017 to discuss Rio Energy's access to the detailed social baseline assessments as well as a process to reach compensation agreements through the framework established by FCP. Therefore, compensation agreements with the *quilombola* communities are contingent on an expected outcome to be reached in the December meeting with FCP (ESAP action 04).

4.2 Labor and Working Conditions

Human Resources Policies and Procedures

Rio Energy has developed a number of human resources policies that are compiled in the Employee Handbook. Policies include the following topics: salaries and additional monetary benefits, training, vacations, insurance, medical examinations policy, reimbursement & travels, recruitment & selection and performance review process. The Handbook also communicates the company's mission, values, approval levels, communications protocol, Sustainability Policy and the Ethics Code.

Working Conditions and Terms of Employment

Currently, the Project employees about 558 employees, most of them (62%) are from local towns of the Project's area of influence. However, once the construction phase is completed this number will reduce significantly. Rio Energy provides adequate working conditions and terms of employment to its direct employees who are part of the teams dedicated to the Project. Specifically, in regards to accommodation services these are provided with good quality and in a consistent manner with the principles of non-discrimination and equal opportunity, including suitable space with natural and artificial light, potable water supply, waste management, kitchen, protection from wildlife, noise and extreme weather, and a healthy working environment. In terms of indirect employees, Rio Energy relies on working conditions and terms of employment provided by the contractors, and on inspections undertaken by the civil construction labor union of Bahia State as well as by the federal Ministry of Labor. Rio Energy will verify –through a verification procedure – the working conditions and terms of employment of its contractors and subcontractors (ESAP action 05).

Workers' Organization

According to the International Labor Organization (ILO) Convention 87 on Freedom of Association and Protection of the Right to Organize, of which Brazil is signatory, and under the national labor code, all employees have the right to freedom of association. Brazil is a country with strong legislation and culture of workers' protection. Also, Rio Energy's human resources policies state clearly the employees' right to freedom of association. In terms of unionization, the scope of the Project falls within the remit of the Civil Construction Labor Union of Bahia State.

Non-discrimination and Equal Opportunity

Rio Energy's Ethics Code contains clear non-discriminatory principles and is aligned with the UN's Universal Declaration on Human Rights.

Workers' Grievance Mechanism

Workers can formulate any concerns regarding the workplace through the joint health and safety committee (JHSC). This mechanism is placed at an appropriate management level and it allows complaints to be raised anonymously, ensuring its effectiveness.

Protecting the Work Force

Rio Energy is committed to following all applicable Brazilian legislation on minimum age and working conditions, which is reflected in the company's human resources policies and procedures issued through the Employee Handbook. Minimum age of employment in Brazil is 18 years old, except for apprentices, for whom in some cases the minimum age can be as low as 14. However, due to the inherent occupational health and safety risks, underage presence is not allowed at Rio Energy's construction sites.

The JHSC Committee is composed of both worker and employer representatives. Together, they mutually commit to improving health and safety conditions in the workplace. The committee is an advisory body that helps stimulate or raise awareness of health and safety issues in the workplace, recognizes and identifies workplace risks and develops recommendations for the employer to address these risks.

Occupational Health and Safety

Occupational health and safety policy and procedures are being implemented and managed by a field-based team comprised by two direct employees. Together with Rio Energy and staff of the three EPC contractors in the field, a total of 24 employees are currently dedicated to managing and supervising occupational health and safety issues. Rio Energy requires that all contractors prepare and implement EHS plans for the construction phase to ensure safe working conditions and practices at the construction sites, through specific contractual conditions, which include induction, training, inspections and recordkeeping of all incidents and near-misses, as well as root cause analysis and follow-up to prevent re-occurrences, workplace condition monitoring programs and routinely reporting of E&S performance to Rio Energy.

4.3 Resource Efficiency and Pollution Prevention

Resource Efficiency

Rio Energy has implemented a Sustainability Policy applied to its employees and contractors' employees in all its supply chain. This policy includes guidelines for environmental risk and impact identification, management and prevention. Aligned with the Sustainability Policy, the "Environmental Guidelines Manual" requires contractors to comply with developing training modules related to environmental best practices, to develop awareness in the use of paper, water consumption, and power consumption, among others. Additionally, the Project has a sustainability 'KPI matrix', which defines indicators to monitor the water and power consumption. Rio Energy will complete the KPIs matrix with targets and/or metrics for all indicators (ESAP action 06).

Water Use & Wastewater Treatment

The Project construction phase demands significant amounts of water for civil works, dust control as well as human consumption. Employee numbers will peak at about 700, and thus water consumption during this stage is substantial. Considering the needs, the Project uses water from three abstraction groundwater wells: (i) N°1 Fazenda Maia, permit valid until July 2021; (ii) N°2 Fazenda Maia, permit valid until March 2019; and (iii) N°3 São Benito, permit valid until May 2021. Although the Project holds the required permits to abstract groundwater from these wells, considering the dryness

condition of the region, Rio Energy will assess potential impacts to shared aquifer resources with the local communities resulting from groundwater consumption (ESAP action 01).

GHG Emissions

Windfarm projects, due to their renewable energy nature, generate positive impacts on GHG emissions during their operations phase. However the Project has not quantified the GHG emissions generated during its construction phase. Rio Energy is planning on installing solar panels at the windpower site in order to save electricity and reduce GHG emissions. Considering that the Project is being implemented in remote place and a significant number of personnel travel and material & equipment transportation are being held by using fossil fuels, Rio Energy will implement a GHG emissions inventory and quantities estimations, and record actions taken to reduce them (ESAP action 03).

Air Emissions and Ambient Air Quality

Emission of particulate matter and dust has been identified as a potential impact during the construction phase of the Project. The Project is therefore monitoring particulate emissions sources on a monthly basis. Rio Energy implements several dust control measures (e.g. watering roads) and paved a 4km extension road in the São Bento community in order to reduce dust generation due to traffic increase.

Noise

The windfarm Project construction site is set a rural environment, with ambient noise levels typical of non-developed areas. There is no human presence at the site of the windfarm or in its immediate vicinity, and therefore although there will be a predicted increase in background noise during both construction and operations of the windfarm, this will not be felt by human receptors. The exception is the São Bento community, which is the closest to the access road and which will feel an increase in traffic noise during construction. During operations, maintenance personnel will use standard noise protection equipment.

Solid Waste Management

The Project has a Solid Waste Management Plan, which includes management of both hazardous and non-hazardous waste, and is applicable for Rio Energy activities as well as those of its contractors. This plan defines the required storage conditions, treatment and final disposal actions to be implemented for each waste generated during construction and operation stages. The Project has adopted universal color pattern codes to segregate solid waste, aligned with local regulations. Wastes are collected and segregated into drums properly labelled and maintained. Finally, solid wastes are stored at the temporary solid waste storage area and collected by an authorized company in charge of final disposal. Solid waste manifests are being kept.

Management of Hazardous Material

Hazardous material includes: liquid fuel (diesel, gasoline), solvents, lubricating oils and other chemicals. Hazardous materials stored at site during construction phase are mainly associated with activities undertaken by contractors. Hazardous materials needed for, or generated by, the installation of the TL are being stored at a second off-site construction site. Rio Energy requires and supervises the EPC contractors (as well as the O&M contractor) to put in place procedures for appropriate storage of hazardous materials, including appropriate segregation, protection from the elements, where required provision of secondary containment, corrosion resistant lining as required and access control.

4.4 Community Health, Safety and Security

Hazardous Materials Management and Safety

The Project will assure that Taboca's construction site is properly fenced in a way that restricts access to people, children or animals (ESAP action 07).

Community Exposure to Disease

As part of the ESIA commitments, the Project is implementing training and awareness sessions to workers and communities related to risks of transmission of communicable diseases, including sexually transmitted. To monitor potential health impact on the local communities, Rio Energy, in a joint effort with the EPC contractors, will implement a health management plan that will include information and awareness-raising campaigns for community members (specifically women and girls) and workforce, including STI and HIV/AIDS. This action will be implemented in coordination with relevant stakeholders such as the women's union, youth groups, health workers, and representatives from communities within the area of influence (ESAP action 08).

Emergency Preparedness and Response

The Project has developed an Emergency Response Plan (ERP) whose scope includes appropriate and different emergency scenarios involving the contractors and facilities associated with Serra da Babilônia Project.

Security Personnel

The windfarm Project site has controlled access and non-armed security personnel.

4.5 Land Acquisition and Involuntary Resettlement

The land necessary for the windfarm plots has been leased by a private owner, under a mutually agreed contract i.e. no involuntary resettlement or land acquisition has taken place. There were no residents on the two plots, and the land was not being used for agriculture or other productive activities. Acquisition of rights-of-way for the access road to the windfarm Project site, as well as the TL, has been carried out on a negotiated basis with the affected landowners, and the Client has already reached easement contracts and paid compensation - totaling 115 easement contracts for the access road and 158 easement contracts for the TL's right-of-way.

4.6 Biodiversity Conservation and Natural Habitats

Baseline Assessment

Biodiversity baseline studies (and subsequent implementation of specific ESMPs, see above) were carried out by local, specialized firms. Studies for flora and fauna were conducted as part of separate ESIA's for the windfarm and transmission line (TL) for the assessment of potential biodiversity and ecosystem risks and impacts. For flora, one baseline campaign was conducted in October/November of 2012. For macrofauna, baseline studies were conducted on two separate field campaigns: in the dry season (April/May 2012) and wet season (October/November 2012), covering amphibians, reptiles, birds, terrestrial mammals and bats. For both birds and bats an additional two campaigns were conducted: in January 2013 and July of 2017. Further, four additional campaigns designed to evaluate presence of migratory avifauna at the Project's directly affected area were conducted in

April-August-October of 2014, and January 2015. Hence, the pre-construction biodiversity baseline for these key components is considered quite robust and comprehensive.

Flora: a total of 184 species were identified. None of these species are considered threatened. *Fauna*: only two species of amphibians were found, and neither is threatened. For reptiles, two species of lizard present conservation status of concern: *Tropidurus erythrocephalus* ('lagartixa-de-cabeça-vermelha'; Near Threatened-NT), a restricted range endemic; and *Tropidurus cocorobensis* (lagartixa; Endangered-EN). Several other macrovertebrate species of some conservation concern were also recorded, but all have large distribution ranges.

Impacts and Risks to Terrestrial Flora and Fauna

For construction, the windfarm footprint extends to just over 5,000 hectares, of which 5.3% will be cleared (264.5 ha) for access roads, wind turbines, offices, storage/workshops etc. and the remainder will be left in its natural status of predominantly *caatinga* (semi-arid), shrubby environment. The TL's right of way is about 292 hectares of the same habitat type and under similar land use as the windfarm area, of which about 160 hectares will be cleared (or pruned) of vegetation. Environmental compensation by way of reforestation activities will be carried out as prescribed in the environmental permits, with a minimum compensation rate of 1:3 for each individual tree removed in the areas cleared. In addition to vegetation removal, key fauna species likely to be affected during construction are reptiles.

The key potentially affected biodiversity groups during operations of the windfarm are birds and bats. Hence, for avifauna a total of 85 species have been identified for the Project's area of influence, 10 of which are considered endemic for the region. A few of these are also under some conservation concern: *Penelope jacucaca* ('jacucaca'; Vulnerable-VU), *Gyalophylax hellmayri* ('joão-chique-chique'; Near Threatened-NT), and *Crypturellus noctivagus* ('jaó-do-sul'; NT). In addition, the following species have been identified in the State Park Morro do Chapéu: hooded visorbearer (*Augastes lumachella*-NT), pectoral antwren (*Herpsilochmus pectoralis*-VU), red-shouldered spinetail (*Synallaxis hellmayri*-NT), and golden-capped parakeet (*Aratinga auricapillus*-NT).

Management of Biodiversity Impacts During Construction

Biodiversity baseline studies and implementation of biodiversity-related ESMPs have been carried out by local, specialized firms. Fauna and flora rescue and re-introductions are being carried out according to best practices, which have included setting up a veterinary recovery unit as well as a plant nursery.

Wind Wildlife Interaction

According to the ESIA study and scientific literature, none of the bird species studied for the Project's area of influence is migratory (of Nearctic or austral routes), and this is reinforced by absence of major migratory pathways in the broad geographical area³. Nonetheless, the four field campaign surveys for migratory did identify two species with notable daily migration movements for foraging, the blue crowned parakeet ('Aratinga-de-testa-azul', *Thectocercus acuticaudatu* -not threatened), and the turquoise-fronted Amazon ('Papagaio-verdadeiro', *Amazona aestiva* - not threatened), which display a daily northwest-southeast flight pattern from their base at the Gruta dos Brejões protected area, and fly at altitudes of about 30-100m (i.e. within the height range of wind towers and hence collision risk). The bird studies also refer to several non-threatened, resident bird species whose normal flight altitude is above 50m, thus with potential interaction or collision with wind towers. Finally, resident

³ Relatório Anual de Rotas e Áreas de Concentração de Aves Migratórias no Brasil (Ministério do Meio Ambiente, 2016): https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=2&cad=rja&uact=8&ved=0ahUKEwiCxrTqi_nWAhVg7oMKHfBxBVQQFggxMAE&url=http%3A%2F%2Fwww.icmbio.gov.br%2Fportal%2Fimages%2Fstories%2FDCOM_Miolo_Rotas_Migrat%25C3%25B3rias_2016_final.pdf&usg=AOvVaw289iArhvUAPFsatfbhkZKI

raptors, although not identified for the windfarm area, are also under risk of collision because of their flight behavior.

Bats have also become a subject of growing recent concern for impacts with wind tower structures⁴. For bats, the ESIA baseline and subsequent field campaigns has identified a total of 24 species for the Project's area of influence. According to the study, none of those species is migratory. Six of those bat species were previously not know to occur in the area, and were identified using bioacoustics techniques. Two bat species, *Lonchophylla inexpectata* and *Myotis lavalii* are data deficient in terms of their IUCN conservation status.

Hence, the overall impacts on wildlife are mainly related to collision risk of bats and resident raptors, as well as some resident foraging birds. The Client will therefore monitor wind-wildlife interactions through the establishment of a Biodiversity Action Plan (BAP). The BAP should include: i) a protocol with a systematic approach using most appropriate methodology (nocturnal ultrasound acoustics for bats, vantage points for raptors, point counts/carcass searches for others), ii) prioritizing high-risk bird and bat species with global biodiversity value, as identified in the ESRS and baseline monitoring studies; iii) use international best practice methods⁵, including displacement and habitat-related effects; iv) include an adaptive management section specifying specific, measurable impact thresholds that will trigger additional impact mitigation measures (none of those mitigations actions would affect the production of the park); and v) engaging a qualified expert to execute the BAP (ESAP action 09). Post-construction BAP monitoring will be carried out for the first two full years of operations.

4.7 Indigenous Peoples

There are no Indigenous Peoples in the Project site and surrounding area and neither along the TL route.

4.8 Cultural Heritage

The Serra da Babilônia region in Brazil's Chapada Diamantina plain is known for having a rich cultural heritage, both archeological and speleological. Both the windfarm Project site and the TL alignment areas were surveyed and studied for cultural resources during the environmental permitting process (ESIAs) for both cases. The results of such studies led to several findings being recorded and reported to the National Institute for the Protection of the Artistic and Historic Patrimony (IPHAN – *Instituto do Patrimônio Histórico e Artístico Nacional*), in accordance with its established procedures; consequently, Project locations (TL, substation, accesses, etc.) were adjusted/deviated according those findings, in order to preserve them and comply with IPHAN recommendations. As a result, Rio Energy has developed an 'Archeological Prospection and Rescue Program', which includes a chance find procedure. The program is being implemented on a daily basis during the construction phase by a specialized third party ('Preservar').

5. Environmental and Social Action Plan (Annex I).

A. Contact Information

For inquiries about the Project, contact:

⁴ <http://www.bioone.org/doi/abs/10.1644/09-MAMM-S-104R.1>

⁵ e.g <https://publications.iadb.org/handle/11319/6518#sthash.vso9Dh7u.dpuf> and section 2.1.4 of http://www.ifc.org/wps/wcm/connect/2c410700497a7933b04cf1ef20a40540/FINAL_Aug+2015_Wind+Energy_EHS+Guideline.pdf?MOD=AJPE RES

Karollyne Matuchack Machado

Project Finance Manager

Tel: (+55) 21 3733 2971

Email: karollyne.machado@rioenergyllc.com

Address: Rua Jardim Botânico 518, 5º andar - Rio de Janeiro, Brazil. 22461-000

For inquiries and comments to IIC, contact:

IIC's Communications Group

E-mail: divulgacionpublica@iadb.org

For Project inquiries, including environmental and social questions related to an IIC investment, please contact the client or the IIC using the contact information provided above. In addition, affected communities have access to the IIC Independent Consultation and Investigation Mechanism (<http://www.iic.org/en/who-we-are/integrity-and-transparency>).

Tel: +1 (202) 623-3952

Fax: +1 (202) 312-4057

Address: 1300 New York Ave. NW Washington, DC. USA. 20577

E-mail: mecanismo@iadb.org or MICI@iadb.org

Annex 1.

ENVIRONMENTAL AND SOCIAL ACTION PLAN (ESAP)

PROJECT: 11994-02 - Serra da Babilônia Windfarm - Guarantee

Number	Applicable Performance Standard	Action	Deliverable	Due Date
01	PS01	Assess impacts of water consumption via groundwater wells during the construction phase of the Project, considering potential impacts to shared aquifer resources with the local communities resulting from groundwater consumption.	Water consumption impact assessment, based on secondary information, including at least: groundwater uses in the region, aquifer recovery time estimation and implementation of mitigation measures, if/as applicable.	Two months after the Effectiveness of the Guarantee
02	PS01	Prepare a cumulative impact assessment	Cumulative Effects Assessment, based on available secondary information, that will include at least a map showing the geographic distribution of other wind power projects present in the region (existent, in construction phase and foreseen) contemplating risk scenarios related to: a) vegetation suppression and habitat modification; b) air quality; b) noise (i.e. São Bento); c) water resources; d) change of social structure and organization; e) increment of traffic and informal settlements along the road.	Two months after the Effectiveness of the Guarantee
03	PS01	Develop and implement a GHG emissions inventory and quantities estimations for the construction phase (both for the wind farm and transmission line).	GHG Emissions inventory and quantities estimations for the construction phase (both for the wind farm and transmission line), and record of actions taken to reduce it.	Two months after the Effectiveness of the Guarantee
04	PS01	Secure access to <i>Fundação Cultural Palmares'</i> (FCP) previous social assessments of <i>quilombola</i> communities along the route of the Transmission Line. Reach compensation agreements through the framework established by FCP for those communities potentially affected.	Documented evidence of availability of social assessments	March 2018
			Reach an agreement with FCP for the validation of the consultation process and eventual compensation framework with the <i>quilombolas</i>	April 2018

05	PS02	Verify the working conditions and terms of employment of its indirect workers (i.e. contractors and subcontractors) to independently ascertain working conditions and terms of employment provided by the contractors and subcontractors.	Verification report of the working conditions of contractors and subcontractors employees, including corrective actions as needed	Condition Prior to Effectiveness of the Guarantee, or March 2018, whichever occurs first
06	PS03	Complete the KPIs matrix with targets and/or metrics for all indicators, especially for water and power consumption.	Documented evidence of sustainability KPI matrix with targets and/or metrics for all indicators	Two months after the Effectiveness of the Guarantee
7	PS04	Rio Energy will assure that Taboca's construction site is properly fenced in a way that restricts access to people, children or animals	Documented (e.g. photographic) evidence that areas have been secured	Condition Prior to Effectiveness of the Guarantee
8	PS04	Develop and implement a health management plan that will include information and awareness-raising campaigns for community members (specifically women and girls) and workforce, including STI and HIV/AIDS.	Documented evidence of health management, training and awareness among workers and local communities (including girls and women specifics)	Condition Prior to Effectiveness of the Guarantee
9	PS06	Establish a Biodiversity Action Plan (BAP) to include: i) a protocol with a systematic approach using most appropriate methodology (nocturnal ultrasound acoustics for bats, vantage points for raptors, point counts/carcass searches for others), ii) prioritizing high-risk bird and bat species with global biodiversity value; ii) use international best practice methods , including displacement and habitat-related effects; iv) include an adaptive management section specifying specific, measurable impact thresholds that will trigger additional impact mitigation measures; and v) engaging a qualified expert to execute the BAP. Post-construction BAP monitoring will be carried out for the first two full years of operations.	Biodiversity Action Plan-BAP (draft)	By the start of operations
			Engage a qualified expert to execute the BAP	One month after start of operations
			Final Biodiversity Action Plan containing an agreed monitoring protocol	Three months after start of operations